

LAUNCH CNTL This is Apollo Saturn launch control we're at T minus 1 hour 22 minutes and counting. Cabin purge has now been completed and the boost protective cover has been closed. The 65 percent nitrogen 35 percent oxygen mixture will now be enriched to a 60 40 mixture at liftoff. Just completed were some preflight command tests with the Manned Spacecraft Center in Houston. These tests are to insure that Houston can send commands, and that they are being received on or by the launch vehicle. Also just completed was a first motion signal. This is the first motion of the vehicle as it lifts off the pad. A test signal is sent to the eastern test range and to the Manned Spacecraft Center in Houston to assure that they will get this signal at liftoff. Also, we just received a final go for a Jimsphere release. The Jimsphere is a weather balloon which is the final weather balloon to go up before launch indicating the wind direction. C-band beacons are in check at this time. The C-band beacons aboard the launch vehicle are used in tracking. They give indications of range velocity during the power phase of flight. Que ball sim command was just sent. The que ball is an angle of a tacmeter which is purchased above the launch escape system, and it's read by the spacecraft commander in the spacecraft. It would indicate any deviation from the plan flight through. It reads zero as it sits on the pad and during the test a simulated command is sent to it, and Gene Cernan in the spacecraft reads off what he is reading in the spacecraft during that sim command. The checks in the spacecraft continue to run somewhat ahead of schedule. The spacecraft test conductor Skip Shovin indicated their running ahead and looking good to which Cernan reply we're looking good up here too. The countdown continuing to move along well at this time T minus 1 hour 21 minutes and counting. This is Kennedy Launch Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/06/72 GET 01:12 CST 19:40 MC2/1

LAUNCH CNTL This is Apollo Saturn Launch Control 13 minus 1 hour 12 minutes and counting. At this time Spacecraft Commander Gene Cernan and the Spacecraft test conductor Skip Chauvin are going over some command checks. During these checks the Spacecraft Commander actually gimbles or moves, swings the main engine in the Service Module. He does this using his flight hand controller and this is a system which is done so that if there is a problem with the computer which normally flies these, he can take over and manually fly it. Normally, however, all burns of this engine are done by the computer. Out at the pad, the space vehicle is surrounded by searchlights producing some 225 foot candles of light, a total of 72 20 kilowatt zeon lights and 2 60 kilowatt zeon searchlight banks provide this illumination. At liftoff, approximately 7500 foot candles will be produced from the flame of the Saturn V first stage engines. This is almost equivalent to daylight. Searchlight will also illuminate the Apollo 17 for the first 60 feet of it's flight. Countdown continuing to go smoothly now as we approach the 1 hour mark. T minus 1 hour 11 minutes and counting. This is Kennedy Launch Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/6/72 GET -01:00 CST 19:52 MC3/1

LAUNCH CNTL This is Apollo Saturn Launch Control. We're at T minus 1 hour and counting. T minus 1 hour and counting. Just completed were the C-band beacon checks. These are checks of the beacons, two of them aboard the instrument unit of the space vehicle. These are used in conjunction with C-band radar here at Kennedy Space Center to check the space vehicle during powered phase of flight. A check was just made with the superintendent of range operations who ran through the camera coverage looking at the weather around the various areas to see what camera coverage, and that appears to be satisfactory. Meanwhile, at the pad, the closeout crew has completed securing the white room area, and they are clearing the pad area themselves at this time. Just before they left, they indicated to Cernan that they were completed their jobs going back away from the pad area. Cernan said "We'll see you when we get back." The pad leader responded that "The next face you see had better be a frogman or you're in trouble." The weather appears to be satisfactory. We've been tracking some local buildups, but at this time they're just - they do not seem to be posing any problem for an on-time launch at 9:53 p.m. EST. Now, T minus 59 minutes, 32 seconds and counting. This is Kennedy Launch Control.

END OF TAPE

LAUNCH CONTL This is Apollo Saturn Launch Control. We are at T-55 minutes 54 seconds and counting. Stoney, astronaut Bob Parker, the capsule communicator here in the firing room who has a variety of of functions during this mission; one of which is to set the elevators at the 320 foot level. He actually commands the elevators which are part of the egress system, emergency egress system, for the astronauts. He has just reported that the elevators have now been set at the 320 foot level. In an emergency the crew could come out of their spacecraft into these elevators where they would be lowered at a high speed, 600 feet per minute, to the ground floor or A level floor where they can exit from there into a variety of escape modes; one of which would be down a chute into a blast danger area or a safety area, or they could continue on out and be picked up by armored carriers. Underway at this time with the launch vehicle are some checks of the secure range safety systems aboard the vehicle. These are actually checks of the receivers in that system. A range Safety Officer could terminate the flight of Apollo 17 if it became irratic by initiating emergency cut off, or if necessary a propellant dispersion command. These systems are located on each of the flight stages. There are three stages of the Saturn V. Two receivers in each stage, and they would receive a signal from the range safety officers and then sending through them to through these receivers, they could perform the propellant dispersion. These actions, of course, will be taken only if the vehicle were so irratic that it were endangering some land areas, and of course, only after the crew had used one of the escape options open to them. The test going well at this time. Our countdown continuing T-54 minutes 6 seconds and counting. This is Kennedy Launch Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/6/72 CST 20:02 GET -00:50 5/1

LAUNCH CNTL This is Apollo Saturn Launch Control at T minus 50 minutes 55 seconds and counting. Preparations are underway in the launch control center at this time for a critical power transfer test. The space vehicle at this time is being fed from an external power source, but shortly before liftoff it will be transferred to the internal flight batteries. This test is to ensure that all electrical systems aboard the vehicle function properly on the internal flight batteries. The test takes about five minutes during which time the various elements of the launch team monitor their systems and report in then to the test supervisor, Bill Schick here in the control room that everything looks good during the test. Depending on local weather conditions the various areas around the United States, the flight of Apollo 17 will be monitored or be able to be seen by people as far as 500 miles away. This is the flight as seen of the first stage of powered flight. This would include a large portion the southeastern United States, northern tip of Cuba and the Bahama Islands. The power transfer test is now underway; first stage, second stage, third stage, instrument unit now all going to internal power. Count down continuing to go well T-minus 49 minutes 35 seconds and counting. This is Kennedy Test Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/06/72 GET 00:45 CST 20:06 MC6/1

LAUNCH CNTL This Apollo Saturn Launch Control, we're now T minus 45 minutes 55 seconds and counting. Various elements of launch team reporting in to test supervisor Bill Schick, that they experienced no problems during the power transfer. We now transfer back again to an external power source, which will feed the vehicle systems until approximately 50 seconds before liftoff, at which time the final power transfer to internal takes place. At the T minus 45 minute mark, we'll be watching for swing arm number 9. That's the swing arm which gives access to the Spacecraft to swing back to a retract position, 12 degrees back from the Spacecraft. This is a park position, a standby position, where it remain down until the final moments of the countdown. T minus 5 minutes, it swings back to the full retract position. Once it swing backs, the launch escape system aboard the a-, atop of the Spacecraft can be armed and this system could be used to pull the Astronaut crew to safety in any disaster. Now T minus 44 minutes 52 seconds and counting, this is Kennedy Launch Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/6/72 GET -00:41 CST 20:11 MC7/1

LAUNCH CNTRL This is Apollo Saturn - This is Apollo Saturn Launch Control. We're at T minus 40 minutes, 51 seconds and counting. Swing arm number 9 just retracted a few minutes ago, and, as it retracted, the astronaut crew aboard the space field could feel it moving away from the spacecraft. Eugene Cernan the spacecraft commander commented, "We're really hanging out here in the breeze now." Spacecraft test conductor, referring to the weather indicated that that was just a small breeze. The launch escape system has been armed. The system now could be used to carry the astronauts to safety if necessary. It's also used during the initial phases of powered flight to carry the astronauts away in an emergency. It would fly away in a high arc pulling them to a height, enough so that their parachute systems could deploy, and they could make a normal landing. The system is about 33 feet long. The motor develops 147 thousand pounds of thrust. This is almost twice the amount of thrust of the Redstone rocket, which powered astronaut Alan Sheppard, America's first man into space. The countdown continuing to move along smoothly now. T minus 39 minutes, 36 seconds and counting. This is Kennedy Launch Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/6/72 CST 20:18 GET -00:25 8/1

LAUNCH CNTL This is Apollo Saturn Launch Control. We're at T-minus 35 minutes 11 seconds and counting. Spacecraft commander Gene Cernan has reported back to the spacecraft test conductor Skip Chauvin. He said you've delivered us the best now it's our turn. Thank the guys we want to see them as soon as we can when we get back and I guarantee you we'll do that. Meanwhile C-band beacon checks are going on with the space vehicle. The liquid hydrogen liquid oxygen fully aboard and being replenished at this time to ensure a full load at liftoff. Count down continuing to go smoothly as we approach the half hour mark T-minus 34 minutes 34 seconds and counting. This is Kennedy Launch Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/6/72 GET 00:30 CST 20:22 MC9/1

LAUNCH CNTL This is Apollo Saturn Launch Control T minus 30 minutes 54 seconds and counting. Manned Spacecraft just indicated to the test supervisor Bill Schick that we are go for the terminal countdown sequences. Final propulsion checks have been completed and the C-band readouts, once again repeated have been completed. Beach boss reports the launch sight recovery force helicopters are on station and ready. Digital range safety command checks are now underway as the countdown continues smoothly aiming for the T minus 30 minute mark. Now at T minus 30 minutes 24 seconds and counting, this is Kennedy Launch Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/6/72 -0:25 GET 20:27 CST MC10/1

LAUNCH CONTL This is Apollo Saturn Launch Control. T-25 minutes 54 seconds and counting. Command Module Pilot Ron Evans at this time has armed the reaction control system aboard the service module. He does this by allowing the hypergolic fuels to move down the lines to the engines. At this time he is reading out the temperatures, pressures and fuel quantities in that system. Our weather continues to look good. The major frontal area which had been of some concern earlier, has remained well west of the launch area also some smaller buildups which we have been monitoring do not appear to be coming close enough to cause any concern for our 9:53 PM launch time. That launch will be aiming Apollo 17 for the Taurus-Littrow area of the Moon. This area is named after the Taurus Mountains. These in southern Turkey and the Austrian astronomer, Littrow. The site is expected to yield some of the oldest and some of the youngest lunar samples returned during the Apollo flights to the Moon. Now T-24 minutes 50 seconds and counting. This is Kennedy Launch Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 6/12/72 CST 20:32 GET -00:20 11/1

LAUNCH CNTL This is Apollo Saturn Launch Control
T-minus 20 minutes 55 seconds and counting. Short time from
now we we'll begin chilling the propulsion systems aboard the
second and third stage of the Saturn V vehicle. This neces-
sary to condition them for the flow of the super cool liquid
oxygen and liquid hydrogen. Just a few moments ago the crew
aboard spacecraft America was doing an updated weather fore-
cast. Cernan reported I hope it's as beautiful out there as
it is in here. Countdown continuing to move smoothly at
T-minus 20 minutes 24 seconds and counting. This is Kennedy
Launch Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/6/72 GET 00:15 CST 20:37 MC12/1

LAUNCH CNTL This is Apollo Saturn Launch Control, T minus 15 minutes 52 seconds and counting. The Vice-President of the United States, Spiro Agnew has entered the launch control center now. He'll observe the final portions of the countdown from here and also the launch. Arming and checking of the Service Module reaction control system has now been completed and in progress is the chill down of the S-II, or second stage start tank. Check-outs continuing to go well, some running a little bit ahead of schedule, all on time. T minus 15 minutes 20 seconds and counting, this is Kennedy Test Control.

END OF TAPE

HOUSTON NEWS CENTER

HOUSTON, TEXAS

POST-LAUNCH CONFERENCE

PARTICIPANTS:

WALTER KAPRYAN, DIRECTOR OF LAUNCH OPERATIONS, KENNEDY SPACE CENTER
PAO

PC-12

PAO We'll go ahead and start our post-launch conference at this time, Mr. Kapryan will give you a quick run down on the activities tonight. We do have to get him back to the firing room shortly, so I'm going to ask you to hold your questions.

SPEAKER Turn the sound up please.

PAO I'm going to ask you to hold your questions to a minimum if you can, we need to get Mr. Kapryan who's already had a long day, back to the firing room again. So we'll go ahead and get started. I'd like to introduce at this time the Director of Launch Operations at Kennedy Space Center and the Apollo 17 Launch Director, Walter Kapryan.

KAPRYAN Good morning, ladies and gentlemen. It's a real pleasure to be able to talk to you this morning even though it's somewhat belatedly. I guess I'll run down a little on how the count down progressed until we ran into the problem that caused - that caused the real delay. Just as we were about to pick up the countdown, we did encounter a problem with the - with the multiplexer in the first stage, which I believe I reported to you at the press conference some time back. And as it turned out, with the multiplexer we did change it out and it did not hold up the pick up of the terminal countdown at all. Shortly after the countdown started, we noticed that one of the batteries in the S-IVB apparently appeared to have a greater than normal open circuit voltage decay. A period of about 11 hours that we've been tracking it we had about a drop of one volt in open circuit voltage. This is somewhat unusual in our experience. We were quite concerned about that for some time, however, through analysis and getting back with Eagle Pitcher, the battery vendor, and going over the modification that had been made for the battery since Apollo 16, this was determined to be a normal situation so that problem went away. We then encountered a minor problem with - with the second stage. A helium bottle had a fairly large decay as compared to decay that was - pressure decay that was noted during countdown demonstration tests. When we run decay check during countdown demonstration tests, it decayed at the rate of about 50 psi per minute. When we ran the decay in this count, it had gone up to 92 psi, and allowable decay was 100 psi so we were still within spec, but we were concerned over the fact that we had had a change and what would cause a change. We went back and ran another check and found that the leakage was on the order of 100 psi. We cycled the check valve and 2 valves, took another decay and the leakage had dropped to below 90 psi, so we felt we were in pretty good shape. So, we went ahead with the count on that basis. We did have a minor problem with the IU. In running one of our software programs, and we did have a problem software timing which we didn't understand at first. We ran some simulation on the breadboard and we were able to put that one to bed in about an hours time. So that, in summary, was about all that really happened to us until we went into our terminal countdown sequence. And I think you probably already know exactly - just what did happen. At T-minus 2 minutes and 47 seconds the

KAPRYAN countdown sequence failed to output the proper command to pressurize the S-IVB LOX tank. The control-room monitors noted it and immediately took steps to perform that pressurization manually. This was done, and at the time that we had the cutoff, we were up to pressure and everything was normal. The problem was that since the TCS did output the command, the logic circuitry said that we really didn't complete all of the launch prep for the S-IVB stage, and we do have an interlock in our countdown circuitry that precludes the retracting of swing arm I which occurs at T-minus 30 seconds if this has not occurred, and that is the reason for the cutoff. Now, it didn't take us very long to determine that we should bypass this command failure and go through the pressurization, manually, and go through the rest of the countdown, except we weren't completely certain that the final 30 seconds would all work properly. We did have a problem. How did we know that the last 30 seconds would work properly? How did we know that once we started igniting the 5 first-stage engines that perhaps we would get a cutoff on one of them, which we wanted to avoid at all costs. So that was the time consuming feature in the delay. We performed the operation of installing the jumper which we were able to do in the firing room. We have a preplanned design where we can go in with banana plugs and put in jumpers to jumper any point in the circuitry that we desire to without having to go out to the mobile launcher, and that is what we did. The same jumper was installed in the breadboard at Huntsville, and the sequence was run through several times on the bread board, and everytime we had a successful - a successful run. We knew that there was in this particular card where we had the problem, there was a sequence that occurred at T-minus 22 seconds, the guidance alert sequence. We weren't - that's actually a discreet event. We were a little concerned over that one. Our logic told us that we could lose that and it would not interrupt the sequence what-so-ever. We went back to the bread board in Huntsville to demonstrate that. We actually cut that command off and ran through the sequence again with the jumper and everything worked fine. We had every assurance that the failure we had was in no way connected with engine start circuit, which is the one that personally gave me the greatest concern. Once we were satisfied that we had no problem in that area, we picked up the count and went on our merry way.

QUERY Did you have a premature ignition? Did we see something - -

KAPRYAN No, what you saw was a perfectly normal occurrence for the condition we were in. When we have a cutoff at T-minus 30 seconds, there's an awful of something going on a lot of hydrogen being vented into the burn pond and it flames up quite a bit. It was a perfectly normal occurrence for the condition we were in.

QUERY No squibs were ignited.

KAPRYAN That's correct. It's perfectly normal Doug.
PAO Down here.

QUERY A couple of questions, please. Do we know why at this time the sequencer did not automatically cut in the pressurization of the lox tank - the lox tank in the third stage.

KAPRYAN Well, we're not 100 percent positive but we are fairly certain that we know. It could be one of 2 things. We could have had a couple of diodes fail, or we could have - in the circuit board, we could have some spread pins. We make them check that for the countdown demonstration tests where we pull the drawer, the TCS drawer and then we reinsert it. And, we have had a history over the past several years, with printed circuit cards of this nature, having problems with pins being spread and creating opens for us. Now we think that's what happened, but I can't tell you 100 percent at this moment that that is exactly what did happen.

QUERY (garbled) I don't understand what you said in reviewing the problem about the guidance alert, which is one of - one of several sequences that happen after T-minus 30 and why that was particularly worrismatic, as far as getting a shut-down of an engine.

KAPRYAN It was the one remaining event that was - in the chain that was driven by the relay driver that was driving the relays that were in - that the one relay evidently failed. Not the relay, but the circuit that failed. There's one relay driver that drove 6 commands, and this T-minus 22 command was one command that since we shut off at T-minus 30 seconds we didn't get down to so we thought that perhaps we might not have that command and we wanted to make sure that by not having it we were still okay.

PAO Okay, Bill, we're getting a mike to you, over here.

QUERY I don't that this is a question properly addressed to Walt Kapryan, but I would like to get an answer as soon as possible, on it we got - -

END OF TAPE

QUERY This is a question properly addressed to Walt Kapryan, but I would like to get an answer as soon as possible on it. We got off two hours forty minutes late, when do we get back on the timeline and how do we do that?

KAPRYAN I can't tell you exactly when we get back to the timeline. We will arrive at the Moon at the same calendar time as though we had lifted off at 9:53. The TLI, - We will target the TLI and we will make the necessary corrections in the TLI burn to get us to the Moon at the same time that we would have gotten there, had we lifted off at 9:53.

QUERY Unaudible.

KAPRYAN Yes, I guess it varies a little bit. There are some variables, that when I left the firing room the last prediction was, that it was going to occur about 3:45 this morning. I think they were predicting 3 hours, 12 minutes, and 34 seconds after liftoff. I don't remember how that compares with the nominal.

SPEAKER Okay. Dwayne can you get Ed Pitts down here and then if we can get a mike over in this center column can one of the mike-handlers get the mike over to the center column?

QUERY I'd like to know what the astronauts did, or talked about or anything, that was going on as far as they were concerned during the delay.

KAPRYAN Well, of course, I was busy having sessions on resolving the problems. So, I personally did not talk to them, however, the capsule communicator and my launch operations manager Paul Donally did talk to them, kept them up to date on the status of our evaluation and troubleshooting and they took it quite well, and just took advantage of the time to rest as much as they could.

PAO Okay. Stand by for just a second. We'll get this mike fixed.

QUERY Were you at any time giving serious consideration at all to letting the launch slip until tomorrow's window?

KAPRYAN Well, when you run into a problem, before you get it resolved, you always have that concern. When we were about an hour into the - an hour and fifteen minutes into the troubleshooting, we knew that we would not be able to recycle for tomorrow. Or for today, rather. We never did get to the point where we gave up and say, it looks like we're going to have to quit. We knew we had quite a bit of time left, so we just worked the problem and didn't think about scrubbing.

QUERY At that stage of T minus 30 seconds, did the astronauts go into any sort of emergency procedures in case they had to abort?

KAPRYAN They didn't do anything any different than they do for any, for any launch. The abort is an every present possibility even if everything is going nominally, so nothing was done differently this time, from any other launch.

PAO Okay, let's take one more question from Doug over here and then we'll go to Houston. We've got some questions out there. - -

QUERY 3:45, is that E.S.T. or G.E.T.?

KAPRYAN It's E.S.T. The G.E.T. was predicted to be 3 hours, 12 minutes, and 34 seconds after liftoff.

PAO Okay, do we have some questions now from Houston?

PAO Okay. You can go ahead.

QUERY (Inaudible) at. What the effect may be on the crew fatigue-wise, if this is going to cause them any problems, and what sleep periods may be changed. Have you got any handle on that?

KAPRYAN Well, I don't have any handle on it. First of all, it's not going to create any big problems. As I had indicated earlier, they took advantage of the delay to get some rest. Of course, I am sure there is bound to be some additional tenseness not knowing how the thing is going to turn out. And with respect to their rest cycles, I guess you will have to address that to the flight director.

SPEAKER Okay, let's come back here to Kennedy and we'll get just a couple more and then we're going to have to cut it off. Dewayne can you get this up here?

SPEAKER Dewayne, over here in the blue shirt, he's been waiting quite awhile.

QUERY Due to the fact that TLI will be changed, how would this effect the timing of the whole mission as a whole. Reference to the EVA's and the transearth insertion. Would this change anything in the timing or just the G.E.T. be picked up?

KAPRYAN It's not going to change anything. The EVA's and lunar activity will be exactly as scheduled. Now of course, the ground elapsed time when the spacecraft gets to the Moon is going to be different. But they're going to get there at the same time, that they would have gotten there, had we lifted off at 9:53. Now, I'm not certain how they're going to play that. If you recall, when we launched Apollo 14, we launched 40 minutes late. They of course made the TLI correction to get to the Moon at the right time. And in order to simplify using the flight plan, I think they updated their G.E.T. reference, so that they were using a fictitious G.E.T. reference that put them back on their flight plan.

SPEAKER Okay. We'll take just a couple more. Mary you come down here and then we'll go to Houston.

QUERY Kapy, did I understand you correctly - -

SPEAKER No we had no light on.

QUERY Did I understand you correctly, that if we hadn't gone tonight - -

SPEAKER Do you all have a problem with the line getting to us?

SPEAKER Well if we - If you're having a problem with the line getting in to us.

QUERY That we couldn't have gone tomorrow.

KAPRYAN If we had scrubbed at the end of today's launch window, and had no problems other than nearly to go through the functions of recycling, we would miss the T minus 0 for tomorrow by an hour and a half, which says that we would have a chance to salvage

KAPRYAN part of the next day's window. However, had we scrubbed and gone back in and taken equipment out and run checks and things of that nature, I don't think we could have launched for the next window. Not have made the next window.

QUERY I would also like to know, who made the sequencer?

KAPRYAN Pardon.

QUERY Who made the sequencer?

KAPRYAN Well, the ESE was designed by Marshall, and I believe GE did most of the design. And exactly who put the hardware together, I can't tell you.

SPEAKER Jerry, right back here and then we'll see if there's any news and then we're going to call it quits.

QUERY Mr. Kapryan, how were the pulse rates at minus 30 when they stopped it? Did they get a little excited?

KAPRYAN No. They were normal.

SPEAKER Okay. We'll give Houston one last chance to get through.

SPEAKER Okay, thank you very much, Mr. Kapryan.

KAPRYAN Thank you.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/6/72 CST 20:41 GET -00:10 13/1

LAUNCH CNTL This is Apollo Saturn Launch Control at T-minus 10 minutes 55 seconds and counting. At this time some computer checks being run with the launch vehicle. The spacecraft has now gone to full internal power. Up to this point the spacecraft fuel cells have been sharing the power load with an external source. Also going on at this time are some checks of the astro comm circuit. This is the circuit which is used by the launch operations manager spacecraft test conductor Stony and the three astronauts at launch time. This is to ensure that they are not getting any extrenious voices or are having to listen to any of the other network which might be carrying on a conversation which they don't need at that time. Countdown proceeding smoothly T-minus 10 minutes 15 seconds and counting. This is Kennedy Launch Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/6/72 GET 00:08 CST 20:44 MC14/1

LAUNCH CNTL This is Apollo Saturn Launch Control T minus 8 minutes and counting. T- minus 8 minutes and counting. The Vice-President in the firing room at the launch control center, observing the final minutes of the countdown and he'll watch the launch from here. The countdown has proceeded smoothly since picking up at 11:53 A.M. this morning. Weather continues to look good as we aim toward a 9:53 P.M. Eastern Standard Time launch. Now T minus 7 minutes 37 seconds and counting, this is Kennedy Launch Control.

END OF TAPE

LAUNCH CONTL This is Apollo Launch Control. T-5 minutes 54 seconds and counting. At this time entering the final phases of the countdown various elements of the team reporting into Test Supervisor Bill Shick with the go no-go for launch. At launch time a water deluge system at the pad will spray water over the entire area of the pad, some 400 000 gallons of water. More than the average family would use in three years will be spread over the pad and the swing arms protecting them from the searing flames of the Saturn V first stage. Various elements reporting in now. First stage reporting they are GO. Range Safety, Superintendent Range Operations they are GO. Launch Operations Manager reports he is GO for launch. Launch Director Walter Kapryan has given a GO for launch. We've passed the 5 minute mark, T-4 minutes 55 seconds and counting and swing arm No. 9 now coming back to the fully retracted position. The launch escape system setting atop the spacecraft, spacecraft named America by the crew. now could pull the crew to safety if there were any problem while the vehicle remains on the pad or during the early portions of the flight. At the T-4 minute mark we'll be standing by for word from the Launch Vehicle Test Conductor Norm Carlson, giving a clear for launch for the launch vehicle ignition. At T-3 minutes 7 seconds we'll go on an automatic sequencer. It's called the terminal countdown sequencer. The astronauts on the Astro com circuit now reporting and thanking the launch team for all their prayers and all their help. T-3 minutes 55 seconds and counting. Apollo 17, the launch team wishes you good luck and God speed, reports the launch operations manager over the Astro com circuit. T-3 minutes 40 seconds, the countdown continuing to go on smoothly. Once we go on the terminal countdown sequencer, the countdown will be automatic from there on out. The countdown sequencer will initiate the various functions from that time on; however, the men here in the firing room will be monitoring their consoles, watching temperatures, pressures, various readouts. They could override that terminal sequencer if necessary. Moving up now to the time when we'll go on that terminal sequencer. T-3 minutes 10 seconds and counting. Spacecraft ready light has come on indicating that the spacecraft is ready. We are now on the terminal sequencer. Launch sequence has started. The flowing of that water on the pad will begin at the 1 minute mark flowing on the flame deflector below the launch vehicle on the launch pedestal itself and along the swing arms which will be coming back at liftoff. Instrument unit ready light has come on. Emergency detection system ready light is on. All indications are we are GO for launch as we approach the 2 minute 30 second mark. Pressurization of the various propellant tanks now aboard the space vehicle is starting. At two, our second stage liquid oxygen tanks now pressurized. These propellant tanks are pressurized with helium to insure that during the flight the fuel

flows properly down through the engine. It's quiet here in the firing room now as the men are monitoring their consoles, looking at the temperatures, checking pressures and a variety of parameters to ensure everything is in a GO condition. Pressurization continuing on the fuel tanks at this time we'll go to the critical power transfer at the T-50 second mark in the count down. At that time we'll transfer external power source to the flight battery aboard the space vehicle. The final action by the crew aboard the spacecraft America will be a final guidance alignment conducted by the Spacecraft Commander Gene Cernan. The flight of Apollo 17 will be able to be seen depending on weather conditions, some 500 miles away as it goes into Earth orbit. Pressurization continuing, liquid hydrogen tanks now aboard the second stage have now been pressurized, all propellants aboard the second stage now pressurized. A cover aboard the cue-ball

END OF TAPE

LAUNCH CNTL A cover aboard the que ball. This is the que ball system on top of the launch escape system will be pulled off just shortly before launch. First stage propellant tanks have been pressurized. Now past the 1 minute mark and we are going on internal power. Now all systems to internal power. We'll be looking for the engine start sequence at the 8.9 second mark in the countdown. Engines will build up to a thrust of 7.6 million pounds. T-minus 30 seconds, we have a cutoff, we have a cutoff at T-minus 30 seconds. We are standing by at T-minus 30 second mark. We'll bring word to you just as soon as we get it. We have a cutoff at T-minus 30 seconds. T-minus 30 seconds and holding. This is Kennedy Launch Control.

LAUNCH CNTL This is Apollo Saturn Launch Control. We're holding at the 30 second mark. This was an automatic cutoff. Cutoff by the terminal sequencer as mentioned this sequencer initiates various actions. Each action must take place and must be completed before the next one can be initiated. If anything does not get completed in time there will be an automatic cutoff. This cutoff was automatically done by the sequencer. We're standing by now to check just what the problem was. Now at T-minus 30 seconds and holding. This is Kennedy Launch Control.

LAUNCH CNTL This is Apollo Saturn Launch Control. The astronaut crew aboard the spacecraft going through their various safing now. Safing of all systems and the launch team here continuing through their emergency procedures. We'll be standing by to check out the problem just as soon as we can get word. T-minus 30 seconds and holding. This is Kennedy Launch Control.

LAUNCH CNTL This is Apollo Saturn Launch Control. The safeing procedures continuing at this time. Up to the T-minus 30 second mark the countdown had been proceeding smoothly. Weather conditions at launch were predicted to be and appears to be good at that time. However, we had an automatic cutoff from the terminal countdown sequencer and we're standing by to see just what caused that automatic cutoff. All systems being safed at this time. T-minus 30 seconds and we are in a hold. This is Kennedy Launch Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/6/72 GET 00:30 CST 20:59 MC17/1

LAUNCH CNTL This Apollo Saturn Launch Control. We're continuing in our hold at the 30 second mark, while the launch team assesses our problem. The swing arm, swing arm number 9 will be brought back to it's park position, which is 12 degrees back from the space vehicle. Continuing the safing procedures this time and assessing the problem, holding at T minus 30 seconds, this is Kennedy Launch Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/6/72 GET 00:30 CST 21:04 MC18/1

All dead air.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/6/72 GET 00:30 CST 21:12 MC19/1

All dead air.

END OF TAPE

LAUNCH CNTL This is Apollo Saturn Launch Control. We're at T minus 30 seconds and continuing our hold. The problem was with the terminal countdown sequencer, which failed to give the command to pressure, pressurize the third stage lox tank. The crew in the firing room, realizing this were seeing this happen pressurized the tank manually, but this did not happen fast enough to satisfy the automatic sequencer. As was mentioned earlier, during this sequence everything must happen at a certain time, before the next step in the sequence can take place. The next step that was to take place was the retraction of swing arm 9 and at the time that was to take place the terminal sequencer had not had an indication that the third stage lox tank had been pressurized. The plan now is to recycle to the T minus 22 minute mark in the countdown. Now this recycling procedure will take an additional 35 to 40 minutes. This still puts us well within our launch window. While we're recycling, we'll continue to review the data to determine just what the problem is and whether or not we can proceed from the T minus 22 minute mark for a launch later in the window. The crew aboard the spacecraft has been alerted to the problem and understand what is happening. They're standing by there at this time. Now at T minus 30 seconds and holding, this is Kennedy Launch Control.

LAUNCH CNTL This is Apollo Saturn Launch Control. We're remaining still in the T minus 30 second mark. We'll remain here for some period. It will take approximately 35 to 40 minutes to recycle back to T minus 22 minutes, where we'll resume the count. To explain again what has happened was we were in what was called the terminal countdown sequencer. At 3 minutes 7 seconds in the countdown we go on to an automatic system called the terminal countdown sequencer. This countdown sequencer initiates various actions, the final actions in the count. Each of these must occur on schedule and in sequence. Now what happened at this particular time was, the third stage liquid oxygen tank was not automatically pressurized as it should have been. The launch crew here in the firing room, when they saw this, manually pressurized that system, but it was too late to satisfy the sequencer. The next event in the sequence was the retraction of swing arm number 1, swing arm going over to the first stage and at that time, the sequencer did not see that the tank had been pressurized and sent an automatic cut-off. So we had an automatic cut-off at the 30 second mark. We're standing by at the 30 second mark to go back to T minus 22 minutes and we are re-evaluating the problem, looking at the, what caused the sequencer not to automatically pressurize that tank, seeing what that problem is and seeing if there is a possibility if we go ahead and do this manually early in the sequence, if that will satisfy the

APOLLO 17 MISSION COMMENTARY 12/6/72 GET 00:30 CST 21:15 MC20/2

LAUNCH CNTL sequencer and we can proceed. Now holding at the T minus 30 second mark in our countdown, this is Kennedy Launch Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/6/72 CST 21:25 GET -00:30 21/1

LAUNCH CNTL This is Apollo Saturn Launch Control. We're continuing to stand by here at the T-minus 30 second mark in the countdown. The crew remaining perfectly calm in their spacecraft. They have gone through their safeing checks. The various safeing checks of the launch vehicle have been completed. We are now going through preparations for recycling to the T-minus 22 minute mark. Standing by at this time at T-minus 30 seconds. T-minus 30 seconds and holding in the countdown for Apollo 17. This is Kennedy Launch Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/6/72 CST 21:30 GET -00:30 22/1

LAUNCH CNTL This is Apollo Saturn Launch Control. We're continuing our hold at the 30 second mark. We'll recycle to the T-minus 22 minute mark. The T-minus 22 minute mark is chosen as the recycling point because this is the point where we start the chill down as was mentioned during that point in the countdown. We start the chill down of the second and third stages to prepare them for the influx of the liquid hydrogen, the cold liquid hydrogen and the cold liquid oxygen. This chill down has some very specific parameters and must be started at a certain time and cannot go beyond a certain time. So it's best to go back to that point in the countdown under these circumstances and to resume our countdown at the T-minus 22 minute mark. When a determination is made that we can resume. Continuing to look at the data here is see exactly what happened. There is no indication of ignition. Ignition was scheduled to come at the 8.9 second mark. Here in the control room a number of the people were looking through the remote cameras which have the capability out at the pad of zooming in on specific areas and a number of people here were looking right at those first stage engines and there was no indication whatsoever of engine ignition. We're continuing to evaluate all the data at this time as we hold at the T-minus 30 second mark. This is Kennedy Launch Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/6/72 -00:00:30 GET 21:35 CST MC23/1

LAUNCH CONTL This Apollo Saturn Launch Control still in our hold at the 30 second mark. While the launch team here is busy recycling to the T-22 minute mark, the mission team out at the Manned Spacecraft Center also preplanning some of the new time for the mission. They are also at this time busily preplanning the new launch azimuth. The azimuth now if we go at the next opportunity would be the 81.06 degrees. This will be automatically fed into the instrument unit of the Saturn V vehicle from the Manned Spacecraft Center. All elements of the launch team now putting everything together, checking over data and doing their best to put us back into a recycle position ready to pick up the count at the T-22 minute mark. Still evaluating data, however, and we have not at this time been given a GO for that resuming of the countdown. T-30 seconds and holding at this time. This is Kennedy Launch Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/6/72 CST 21:40 GET -00:22 24/1

LAUNCH CNTL This is Apollo Saturn Launch Control. Continuing our hold at the 30 second mark back at the mission control center in Houston the flight controllers re-turning to their seats now after some consultation. They're back now giving status check and getting ready in case we are - it is determined that we can pick up the count. In the firing room here, the Apollo Program Director Rocco Petrone has moved into the viewing area where the President - Vice President Spiro Agnew and NASA administrator James Fletcher are and he is giving them a briefing and a run down on our problem. We are standing by at this time. The clock has now been recycled to the T-minus 22 minute mark; however, we have not picked up the count at that mark. We are now at T-minus 22 minutes and holding. This is Kennedy Launch Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/6/72 GET 00:22 CST 21:45 MC25/1

LAUNCH CNTL This is Apollo Saturn Launch Control, continuing to stand by at the T minus 22 minute mark in the countdown. Recycling operations have gone well. We're back to the T minus 22 minute mark and at this mark which we will pick up the count if we are given a go to resume. Check has been made of the Mission Control Center team at the Mission Control Center in Houston. All elements of that team reporting that they are ready to resume as soon as they get the word. Now standing by here at Kennedy Space Center, while data is reviewed and determination will be made if and when we can resume our countdown for Apollo 17. Now at T minus 22 minutes and holding, this is Kennedy Launch Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/6/72 -00:22 GET 21:49 CST MC26/1

LAUNCH CONTL This Apollo Saturn Launch Control. We are continuing to standby at the T-22 minute mark. We are hoping to resume the count shortly. The problem has not been resolved. We're continuing to look into it; however, it has been determined that a resolution one way or the other should be able to be made shortly. So right now we are continuing our recycle procedures hoping to pick up the count perhaps just minutes from now. If the problem is not resolved by the time we reach the T-8 minute mark after we continue to count down, the clock will be held again. Right now we are continuing the recycling procedures hoping to pick up shortly at T-22 minutes. We are now T-22 minutes and holding. This is Kennedy Launch Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/6/72 CST 21:52 GET -00:22 27/1

LAUNCH CNTL This is Apollo Saturn Launch Control. We're continuing to stand by at the T-minus 22 minute mark. We've been given the word here in the firing room now that the count will be resumed at 11 p.m. at T-minus 22 minutes. At this time there still has not been a resolution to the problem, but we'll continue looking at that. We could continue on counting down while this problem is looked at. To reiterate what the problem was; the terminal countdown sequencer failed to give the command to pressurize the third stage liquid oxygen tanks. The crews monitoring this function saw that that happened and immediately manually pressurized the tanks, but this did not occur in time in the sequence and when swing arm one was to retract it had not received this signal. As a consequence an automatic cutoff was sent. There are several possible work arounds to this they are being looked into at this time, and we plan to resume our countdown at the T-minus 22 minute mark at 11 p.m. Now holding at T-minus 22 minutes. This is Kennedy Launch Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/6/72 GET 00:21 CST 21:58 MC28/1

LAUNCH CNTL This is Apollo Saturn Launch Control. We're at T minus 21 minutes 10 seconds and counting. The count-down picked up the launch team here made a quick check of the various elements, all reporting in to the test supervisor Bill Schick, indicating that they were ready to resume the count. Now counting at T minus 20 minutes 53 seconds, and we'll continue to countdown here as we look at the problem which caused the hold at the T minus 30 second mark. Now at T minus 20 minutes 42 seconds and counting, this is Kennedy Launch Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/6/72 -00:14 GET 22:05 CST MC29/1

LAUNCH CONTL This Apollo Saturn Launch Control. We're at T-14 minutes 35 seconds and counting in our countdown for Apollo 17. Back at the Mission Control Center the men there are updating the launch azimuth. Launch azimuth standing now at 82.54 degrees. This will automatically be feed into the instrument unit. The swing arm, swing arm No. 9, the access arm to the spacecraft, remains at the 12 degree position it will remain there until the T-5 minute mark in the countdown. Going on at this time are the recycling of some of the vents for the liquid hydrogen and the liquid oxygen. These are the vents which allow the venting of the gases as there is some boil-off occurring. It is necessary to continue venting these to ensure they do not freeze in either an open or closed position. The countdown proceeding smoothly now. T-13 minutes 43 seconds and counting. This is Kennedy Launch Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/6/72 CST 22:10 GET 00:09 30/1

LAUNCH CNTL This is Apollo Saturn Launch Control. We're at T-minus 9 minutes 36 seconds and we are counting. However, we do plan to continue the hold at the T-minus 8 minute mark. We can hold at that point for 20 minutes and plan a 20 minute hold while the launch crew here satisfies themselves that they have worked out a good solution and a work around to the problem. The crew has been alerted aboard the spacecraft. Cernan indicated that perhaps they could start a nice conversation about a good book, Thomas Hardy or something like that. Countdown continuing now aiming toward the 8 minute mark at which time we'll hold. T-minus 9 minutes now T-minus 9 minutes and counting. This is Kennedy Launch Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/6/72 GET 00:88 CST 22:12 MC31/1

LAUNCH CNTL This is Apollo Saturn Launch Control. We're now holding at the 8 minute mark, as planned. The hold at this time is planned for approximately 20 minutes. The crew feels that they have, that they have a work around to the problem, working around the indication going to the terminal sequencer that the tank has not been pressurized, when actually it had been done manually. They are checking all of their data, however, to insure that this is the proper method to work around the problem and that this will result in a smooth countdown from here on. Now at T minus 8 minutes and holding, this is Kennedy Launch Control.

END OF TAPE

LAUNCH CNTL This is Apollo Saturn Launch Control. We're continuing our hold at the 8 minute mark. The launch operations manager has gone over with the launch team their proposed solution a work around. The team appears to be satisfied that it is the proper one. They are now briefing management personnel on the problem and the work around. Out at the pad the liquid oxygen continues to vent from the vehicle and is replenished. Liquid hydrogen is also vented from the vehicle as there is some boil off. However, because it is quite a volital fuel it is vented through a burnpond at the side of the pad. That burnpond is at the north side of the pad and there it can be seen burning in a controlled condition at this time. This is a normal condition, actually during the day this burns in such a pure manner that it cannot be seen. However, at night it is clearly visible. Our countdown continuing to hold at the T-minus 8 minute mark at this time. T-minus 8 minutes and holding this is Kennedy Launch Control.

END OF TAPE

LAUNCH CONTL This is Apollo Saturn Launch Control. We're continuing to hold at the T-8 minute mark. Meantime the crew is getting a variety of updates in the spacecraft, updating them on various aspects and the changes to their mission due to this hold period. Also, at the Manned Spacecraft Center they are continuing to update the flight azimuth as they get new times for the launch. Launch Operations Manager Paul Donnelly just went through quite an extensive briefing with the spacecraft test conductor to pass on to the crew what they feel the problems were and how they plan to work around it. The crew aboard the spacecraft indicated that if the launch team was satisfied with these solutions, that they certainly were confident themselves. Now continuing our hold at the T-8 minute mark this is Kennedy Test Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/6/72 GET 00:08 CST 22:33 MC34/1

LAUNCH CNTL This is Apollo Saturn Launch Control. We're continuing in our hold at the T minus 8 minute mark. At this time, it's been determined to take an additional 20 minutes, add an additional 20 minutes to that planned hold period. The reason for this is, the crews would like to take the work around that they have devised and at Marshall Spaceflight Center, where the Saturn V launch vehicle was developed, they have what is called a bread board or a system, which is similar to this one and run through the sequence and insure that it does operate properly. The crew aboard the spacecraft was informed of this additional 20 minute hold. They indicated that they expected to use all three stages of this Saturn V and they were happy to have the 20 minute hold if that was going to assure that all three were going to work properly. Now continuing our hold at the T minus 8 minute mark, this is Kennedy Launch Control.

END OF TAPE

LAUNCH CNTLE This is Apollo Saturn Test Control. We are continuing our hold at the T-minus 8 minute mark. The reason the T-minus 8 minute mark is chosen for this hold as mentioned earlier has to do with the chill down of the thrust chambers in the S-2 or second stage and the third stage. Both of these stages use liquid hydrogen, an extremely cold cryogenic fuel and the thrust chamber must be conditioned prior to flight so that it's ready at the time of ignition inflight to receive these fuels coming in. To achieve the proper temperature the thrust chamber chill down should not exceed 20 minutes, but it must be on for at least 7 minutes and 40 seconds. So rounding that off the hold was called at the 8 minute mark. We can continuously hold it at this point whereas if we continued on down we would have to watch these parameters very closely so that we did not exceed that 20 minute accumulated cooling time. At this point we can continue our hold and that continuation can be determined by the problem and we can pick up then at any time or continue at long as necessary. We're continuing that hold now at T-minus 8 minutes and holding. This is Kennedy Launch Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/6/72 GET 00:08 CST 22:50 MC36/1

LAUNCH CNTL This is Apollo Saturn Launch Control. We're continuing in our hold at the T minus 8 minute mark. Back at the Marshall Spaceflight Center in Huntsville, Alabama, the crews there are at work on a bread board, or a mock-up of the system in question, where they're putting it through it's paces, checking out the work around solution, that is, jumping around this erroneous signal, and insuring that everything works properly. The crew still standing by in the spacecraft, updating various systems there, updating their flight plan, all continuing to go well there. The crew at the Manned Spacecraft Center also doing considerable amount of updating. They'll be continuing to update the azimuth, and the Launch Control Center here at Kennedy Space Center, the launch team manning their consoles, standing by to pick up the count, when we're given the word to go. However, we're standing by still. At this time, we have no word from the Marshall Spaceflight Center. We're expecting that to come within 10 to 15 minutes from this time. Now at T minus 8 minutes and holding, this is Kennedy Launch Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/6/72 -00:08 GET 22:52 CST MC37/1

LAUNCH CONTL This is Apollo Saturn Launch Control. We're continuing in our hold period at this time. Test Supervisor Bill Shick just announced here in the Firing Room that the hold is expected to last approximately 20 more minutes. Liquid oxygen and liquid hydrogen continuing to be replenished aboard the 3 stages of the launch vehicle at this time. That replenishing will continue during the hold period and during the final minutes of the countdown. The countdown continuing in the hold. T-8 minutes and holding this is Kennedy Launch Control.

END OF TAPE

LAUNCH CNTL This is Apollo Saturn Launch Control at one minute to midnight. We are continuing to hold at the T-minus 8 minute mark. Work is still going on at the Marshall Spaceflight Center in Huntsville, Alabama. Updating of the tracking continuing at the Manned Spacecraft Center in Houston. And the launch team here at Kennedy Space Center preparing to pick up the count. Hopefully, we will be given a go ahead to pick up the count in approximately 10 to 12 minutes from this time. We are continuing to stand by waiting to hear from the testing going on at the Marshall Space Flight Center in Huntsville. To recap the activities earlier today the countdown picked up at 11:53 a.m. after a planned hold period picked up at T-minus 9 hours mark shortly after that time the pad was cleared and we began loading the cryogenic fuels, that's the liquid hydrogen and the liquid oxygen aboard the space vehicle. Those operations actually went a little bit ahead of schedule. The astronaut crew went out to the pad, enter their spacecraft, began checking it out and those operations also running a little bit ahead of schedule. We went on to our terminal countdown sequencer at the 3 minute 6 second mark as scheduled. Everything seemed to be proceeding fine. At the T-minus 30 second mark we got an automatic cut off. It was determined that this cut off came because pressurization of the liquid oxygen tank aboard the third stage was not initiated automatically as it should have been when it was done manually the terminal sequencer did not sense that this had been done and therefore gave the automatic cut off. We're working the problem right now continuing to hold at the T-minus 8 minute mark. T-minus 8 minutes, this is Kennedy Launch Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/6/72 -00:08 GET 23:06 CST MC39/1

LAUNCH CONTL This is Apollo Saturn Launch Control. Continuing to hold at the T-8 minute mark. The hold continues to be planned for approximately 5 to 7 more minutes. However, the launch window should be pointed out tonight extends to 1:31 AM. Now if for any reason we could not make it in that launch window, we could recycle under our present configuration and resume our count aiming for a 9:53 PM EST launch tonight. The window for tonight is the same as it was for last night and this morning - 9:53 PM to 1:31 AM. However, the launch team appears to be optimistic with the solution they've found in the problem and are just waiting for verification and confirmation from the testing going on at the Marshall Spaceflight Center at Huntsville, Alabama. The time now is 7 minutes after midnight. We're continuing to hold at T-8 minutes. T-8 minutes and holding this is Kennedy Launch Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/6/72 GET 00:08 CST 23:20 MC40/1

LAUNCH CNTL This is Apollo Saturn Launch Control, continuing to hold at the 8 minute mark in the countdown. Still awaiting word from the Marshall Spaceflight Center in Huntsville, Alabama, and the result of the test being run at this time up there. Meanwhile, here in the firing room, all elements of the launch team are assessing their position. They are assessing the effect of the hold and this amount of hold time on each of their systems. Everyone, at this time, busily at work here in the firing room, also at the Mission Control Center in Houston, busy there with their flight update. Now continuing to hold at the T minus 8 minute mark, this is Kennedy Launch Control.

END OF TAPE

LAUNCH CNTL This is Apollo Saturn Launch Control. We're at 15 minutes past the hour continuing to hold at the T-minus 8 minute mark. The supervisor just indicated that we finally pick up the clock at the T-minus 8 minute mark in 10 minutes. Planning to pick up the clock at 25 minutes past the hour. The tests being run or have been run now at the Marshall Space Flight Center and indicate that our system is good the way it has been reconfigured. All elements during this 10 minutes will be preparing their various systems to pick up the clock at the T-minus 8 minute mark. Meanwhile, at the Manned Spacecraft Center the flight controllers there also planning to pick up the clock. We just received a go from the superintendent of range operations indicating that the range has been cleared around the new flight azimuth. The Manned Spacecraft Center Houston flight indicates that they are go to pick up the clock at 25 minutes past the hour. Now at T-minus 8 minutes and holding this is Kennedy Launch Control.

END OF TAPE

LAUNCH CNTL This is Apollo Saturn launch control. We're continuing our hold at the T minus 8 minute mark. We have approximately 5 more minutes remaining in that hold. It has been determined that the workaround is a correct and satisfactory one. A bread board or a sample system at the Marshal Spaceflight Center was used to run through the entire sequence as it now configured and that operated satisfactorily. What happened was the - during the terminal sequencer, the liquid oxygen tank was not pressurized automatically. When this was done manually, the indication did not get to the sensors in time so that we had an automatic cutoff. The liquid oxygen tanks aboard the third stage, it has been determined, will be pressurized manually early in the terminal sequence and jumpers have been installed so that we can then feed the information to the sequencer so that it will not have an indication that the LOX tanks have not been pressurized. This - a bread board situation of this has been constructed at the Marshal Spaceflight Center in Huntsville and this has operated satisfactorily. So, it's been determined to go ahead with our countdown on this basis. We'll be planning to pick up the count at the T minus 8 minute mark some 4 minutes from now. Now T minus 8 minutes and holding. This is Kennedy Launch Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/6/72 2325 CST 00:07 GET MC-43/1

LAUNCH CNTL This is Apollo Saturn Launch Control, we are now resuming the count ... T minus 7 minutes 54 seconds and counting. At this time in the Spacecraft update is being given to the Spacecraft Commander, Eugene Cernan. The swing arm is still at the 12 degree position, that is the park position, standing by at the Spacecraft. That will be brought to the full retract position at approximately T minus 5 minutes in the countdown. The flight director just ran through the - his team - a status report from his team at the Mission Control Center. That team all reported they are in a go condition. Now, at T minus 7 minutes 20 seconds and counting this is Kennedy Launch Control.

END OF TAPE

LAUNCH CNTL This is Apollo Saturn Launch Control T minus 5 minutes 40 seconds and counting. At this time the various elements of the launch team have been reporting in to Bill Shigby, test supervisor, indicating that we are GO to continue. Mission director Chet Lee just verified that we are GO for launch. Safety indicates that we have a GO. First stage test conductor, this is the man who has charge of those five first stage engines which will give us the lift off, has indicated a go for launch. Launch Operations Manager, Paul Donnley, also giving us a GO for launch, and finally the Launch Director, Walter Kapryan says we are GO for launch. We've passed the five minute mark now and swing arm number nine, this is the access arm to the spacecraft, is coming back to the full retract position. It moves back along side the mobile launch tower and it will remain there now through the final portion of the countdown and the launch. At the T-minus 60 second mark 20 nozzles will start flame deflector deluge of 13 000 gallons per minute of water pouring down on that flame deflector, so a great deal of what is seen at launch time, which looks like smoke, is actually steam as this water is burned off. This water's to cool the pad area and to cool the equipment along side the launch tower as the water also pours across the swing arms in the launch tower. We are approaching the 4 minute mark in the count down now, T-minus 4 minutes 5 seconds and continuing to count. At the 4 minute mark we'll stand by for a final GO from Norm Carlson, Launch Vehicle Test Conductor. He has given a GO. The Launch Operations Manager now switching over to the astro COMM circuit, this is the circuit that the astronauts, the launch operations manager and the spacecraft communicator will remain on. They have this private circuit to keep extraneous talk off of their circuit. They are checking in, they are checking in now on the astro comm circuit indicating that they are GO. Spacecraft has indicated they are ready. Instrument unit ready light has come on. SLC at the first stage preparations are now complete as we approach the 3 minute mark. There is quiet in the firing room now as the engineers and technicians are monitoring their consoles. They are monitoring the various rates, pressures, temperatures, they can over ride the terminal sequencer if they sight a problem that it has not picked up. We are on that terminal sequencer now, we have passed the 3 minute mark T-minus 2 minutes 47 seconds and counting as we are on the terminal sequencer. At the T-minus 50 second mark we will be looking for that critical power transfer. This is where we transfer from the external power source, which has been feeding the 3 stages of the launch vehicle to internal power to the flight batteries aboard the space vehicle. It's expected that they given

LAUNCH CNTL proper weather conditions people will be observing this flight from as much as 500 miles away. This includes a large portion of the southeastern United States, the northern tip of Cuba and the Bahama Islands. Now approaching the 2 minutes, 2 minute mark, mark T-minus 2 minutes and counting and the countdown continues to move along smoothly now in the terminal countdown portion. The automatic sequencer has stopped the replenishing of the liquid oxygen and the liquid hydrogen. We're standing by now to begin pressurization of the fuel tanks, the second stage fuel tank pressurized, third stage fuel tank pressurized. The countdown continuing to move along smoothly. T-minus 90 seconds, T-minus 90 seconds. Countdown continuing smoothly. S-IVB propellant pressurized, the indication now using the work around showing the S-IVB propellant has been pressurized. Now looking at the liquid hydrogen tank, as they become pressurized LH2 aboard the second stage pressurized

END OF TAPE

LAUNCH CNTL The second stage pressurized, all propellents now aboard the second stage pressurized as we approach the 1 minute mark in the countdown. Mark T minus 1 minute and counting. Now, in the final minute of the countdown - at T minus 45 seconds Gene Cernan will make the final guidance alignment - this is the - Mark T minus 45 and Gene Cernan made that final guidance alignment. That's the last action taken by the crew aboard the space vehicle. Now approaching the half minute mark. T minus 33 ... T minus 30 seconds and continuing on now - continuing on at T minus 26 seconds ... Mark T minus 25. We'll get a final guidance release at the T minus 17 second mark. T minus 17, final guidance release. We'll expect engine ignition at 8.9 seconds ... 10 ... 9 ... 8 ... 7 ... ignition sequence started - all engines are started - we have ignition 2, 1, zero - we have a liftoff. We have a liftoff and it's lighting up the area, its just like daylight here at Kennedy Space Center as the Saturn V is moving off the pad. It has now cleared the tower.

SC Saturn yaw is complete. We're into roll, Bob.

CAPCOM Roger, Geno. Looking great. Thrust good on all five engines.

SC Okay, babe. It's looking good here. Roll is complete. We are pitching.

PAO This is Mission Control. Gene Cernan reporting the launch vehicle maneuvering to the proper attitude, everything looking good at this point.

SC 17 is go.

CAPCOM Roger, 17 you're go.

PAO First stage looks good. Altitude 1.1 miles Booster says we look good. We are now at 2.5 miles.

CAPCOM Mark, mode 1 bravo.

SC Roger, 1 bravo, we're go at 1 minute.

CAPCOM Roger, Gene, you're looking great. Right on the line.

PAO Everybody says "Looking great - Right on the line". We're now 1 mile down range. Launch vehicle 4.2 miles high. Coming up on maximum dynamic pressure at this point. 4 miles down range, 8 miles high and the velocity approaching 3000 feet per second.

CAPCOM Looking great.

CAPCOM Stand by for mode 1 Charley, 17.

SC Mark, mode 1 Charley.

PAO And the flight dynamics officer says we look good on all sources, right on the trajectory.

CAPCOM Roger, 17, you're go.

PAO Flight Director, Gene Kranz, taking a status for staging, we say we look good for staging.

SC Roger, we're go here. - Inboards cut off.

CAPCOM Roger, inboards.

PAO Inboard engines shutting down on time as planned. Crew will experience maximum G forces of about 4 Gs at shutdown. Coming up on first stage shutdown. And we've had shutdown on time on the first stage.

SC On five.

CAPCOM Roger, they're looking here - they're looking good.

SC Sure felt like it. I think we saw them all from here.

CAPCOM Roger, Jack. And the thrust is go on all five of them. They're running good.

SC Okay, 3 minutes and we're go.

CAPCOM Roger, 17.

SC Okay, we just (garble)

CAPCOM Roger, we confirm (garble)

SC There goes the tower. - Oh, there she goes.

CAPCOM Roger, the tower - you're mode 2.

SC Roger, mode 2.

CAPCOM The steering edge converged - the CMC is go - you're going right down the pipe, 17.

SC Okay, Bob. I just confirmed that.

PAO That's the automatic guidance system, the inertial guidance system, performing properly.

SC --the breakers, and we've seen it all, ignition, staging and tower.

CAPCOM Roger, we get you.

PAO Apollo 17 now 65 miles high.

SC Okay, 4 minutes and we're go here, Bob.

CAPCOM Roger, Gene, we're going round the room, looks go here. You're looking real good, Gene, right down the line.

SC Okay, 4:30 and we're still go on board.

CAPCOM Roger, 17. You're go.

SC Let me tell you, this night launch is something to behold.

PAO Coming up on 5 minutes. Everything still looks very good in the launch of Apollo 17. The launch vehicle spacecraft now 80 miles high, 230 miles down range.

CAPCOM 5 minutes, Geno, and you're go down here. You're looking great.

SC Okay, Robert, we're go here at 5.

CAPCOM 17, Houston. Your times are nominal, level sense arm at 8 plus 36 SII shutdown at 9 plus 20. Nominal times.

SC 8 plus 36 and 9 plus 20. Roger.

PAO Capcom, Robert Obermeyer, advising Gene Cernan and the crew aboard Apollo 17 the second stage shutdown at about 9 minutes 20 seconds elapsed time. We'll have that shutdown in about 3 and a half minutes from now.

CAPCOM Standby for S-IVB to COR capability.
 Mark, S-IVB to COR capability.
 SC Roger, S-IVB to COR. We're go at 6.
 CAPCOM Roger, Geno.
 PAO Apollo 17 still right on the nominal trajectory at an altitude now of about 92 nautical miles.
 SC We've got 4 good motors and we're go at 6:20.
 CAPCOM Roger, 17. We copy the gimbal and watched them and they look good.
 CAPCOM Standby for S-IVB to orbit capability.
 Mark. S-IVB to orbit capability. And we'd like copy Delta, check.
 SC Roger, you've got it.
 CAPCOM Roger.
 PAO Now 7 minutes in and we have sufficient velocity to make orbit with the Saturn third stage should we have an unexpected early shutdown of the second stage.
 SC Good on board.
 CAPCOM Roger.
 PAO We're now less than 2 minutes from second stage shutdown and ignition of the Saturn third stage. And the center engine will be shutting down as scheduled in about 10 seconds.
 SC We have inboard cutoff.
 CAPCOM Roger, Gene, inboard on time.
 PAO And that inboard shutdown looked to be on time. Apollo 17 now 625 miles downrange, 93 miles in altitude.
 SC (garble) and we are go.
 CAPCOM Roger, 17, you're looking great.
 PAO The spacecraft guidance systems agreeing very closely with the Saturn guidance. It looks good.
 CAPCOM First staging.
 SC Thank you, Bob. We're go for staging up here.
 PAO Staging now less than 1 minute.
 CAPCOM You have level sense arm this time, Gene.
 SC Roger, Bob, levels sense arm.
 PAO Apollo 17 traveling at 21 000 feet per second. It's achieved about 83 percent of the velocity required for a minimum orbit.
 SC 9 minutes, Bob, and 17 is go.
 CAPCOM Roger, 17, you're go here.
 PAO And about 10 seconds to staging.
 CAPCOM Standby for mode 4 capability.
 SC S-II cut off.
 CAPCOM Rog, mode 4 capability and we copy cut off.
 SC Roger, mode 4 - and we do have S-1VB ignition.

CAPCOM Roger, we see it and the thrust is looking good on it.
SC We saw that one too, Bob.
PAO We're up to 23 000 feet per second - we'll be shooting for something over 25 000.
CAPCOM 17, the steering has converged and CMC is go. You're looking great.
SC Roger, the CMC is go 10 minutes and 17 is go on board.
CAPCOM 17, Houston, you are go for orbit - go for orbit.
SC Those are kind words, Robert. We're go for orbit here.
CAPCOM Good show, Gene.
PAO Coming up on 10 minutes 30 seconds after liftoff and the spacecraft launch vehicle now 11 000 - 1100 miles, rather, downrange, altitude 93.4 miles.
CAPCOM Roger, 17, you're looking great.
PAO And we're about 1 minute from shutdown, about 1 minute from orbit insertion.
SC 11 minutes and we are go.
CAPCOM Roger, Gene, and cutoff will be at 11 plus 47, 11 plus 47.
SC 11 plus 47, Roger.
SC Okay, 11:30 and we're go here and - standing by.
CAPCOM Roger, Gene. Cutoff time is still holding good. Still 11 plus 47.
SC Okay. Cutoff at 42.
CAPCOM Understand cutoff at 42. Roger, we copy.
PAO And that looked like a near nominal shutdown. At shutdown we show 25 600 feet per second. That also looks very close.
SC At 89.5.
CAPCOM Roger, Gene. We're copying the DSKY.
PAO Gene Cernan reporting the on board indication of an orbit of 93.5 by 89.5. Now we'll be getting tracking and confirming that here on the ground.
SC Houston, the - looks like the - tank pressures are venting.
CAPCOM Roger, Gene. The range safety is safe and we - you are in a go orbit, nominal.
SC Roger, go orbit - nominal. Thank you.

END OF TAPE

CAPCOM And 17, we'll (garble) to update that AOS time but 52:20 is looking good.

SC Roger.

PAO This is Apollo Control coming up on 14 minutes after liftoff, that liftoff coming about 2 hours 40 minutes late, and we'll be assessing the effects of that late liftoff on subsequent events in the mission timeline, passing those along. One of the effects will be a change in the acquisition of signal loss of signal time and as we move along on the ground track -

SC C off.

CAPCOM Stand by in there, Jack.

SC I've been carrying very low amps on the BAT BUSS and I did not see a drop. I'm carrying about 2 amps now. Volts are 30.5.

CAPCOM Jack, go ahead and take the BC motor switch off.

SC Okay, it's off and I confirm that one.

CAPCOM And we think it's the (garble) power switch and the fuel cell LAT switch that are drawing the current you are seeing there.

SC Okay, that could well be.

CAPCOM Okay, Jack, we're going to lose you in about one minute off the vanguard here and see you at 52:20.

SC Roger, we're fresh and thanks, Bob. Okay, Bob, everything is looking GO on board. Everything's stable. We can see the AMPs firing and our attitudes look good.

CAPCOM You know everything is good shape down here - the boosters are in good shape, they're looking good and their AOS time is 52:20 as I gave you.

SC We got that, Babe, we'll see you coming around.

CAPCOM Good show, Babe, little late but its a good show.

SC Absolutely right.

CAPCOM Testing Houston, we're hanging with you here. Looks like you're hanging in vanguard a little longer than we expected.

PAO This is Apollo Control at 16 minutes 45 seconds after liftoff. We've confirmed Apollo 17 is in a near nominal orbit. The crew reported an orbit of about 93.5 by 89.5 based on their onboard calculations and computations on the

ground show that we're very close to the nominal ninety mile nautical mile orbit. As a result of the late liftoff, the translunar injection will be a little bit earlier than the flight plan ground elapsed time but we don't have an update on this time yet. We expect that it will be on the order of 8 to 10 minutes early. We'll update that time as we get a later update. We would expect that the time of arrival at the Moon will be approximately the same as the flight plan time in terms of Greenwich Mean Time. The ground elapsed time will be somewhat earlier and we expect that there will be clock update - a so called clock update - at some point where we make the clocks in Mission Control and aboard the spacecraft agree with the ground elapsed time that they would be showing in the flight plan. The net effect will be that we'll arrive at the Moon in a shorter ground elapsed time - in effect about 2 hours 40 minutes earlier than the flight plan would show, but at the same Greenwich mean time or local time here on Earth, that - that we would have had had we lifted off on time. We're in effect making up the time by speeding up the arrival at the Moon. The spacecraft at translunar injection will be going somewhat faster than a nominal liftoff translunar injection. Consequently, it will arrive at the Moon going slightly faster, and also somewhat earlier, about 2 hours 40 minutes earlier in terms of ground elapsed time. This will also mean that the lunar orbit insertion will require a bit more energy to slow the spacecraft down and get it into lunar orbit. These details of course, will all be worked out in the time that we have before our lunar orbit insertion. And, when we get an updated translunar injection time, we'll pass that along

END OF TAPE

PAO This is Apollo Control at 24 minutes. Apollo 17 now in an orbit about 90 miles by 93 miles and everything appears to be nominal aboard the spacecraft and aboard the launch vehicle, Saturn third stage. One additional impact of our late liftoff will be the loss of television coverage for the transposition and docking maneuver. The television coverage will not be possible because the ground track has shifted and we don't have the site coverage that had been expected for television. The translunar injection burn, reigniting the Saturn third stage to put the spacecraft on its trajectory to the Moon, is now scheduled to occur at a ground elapsed time of 3 hours 12 minutes 35 seconds, or roughly 9 minutes earlier than the flight plan time. This again the effect of the late lift off. And we will be reacquiring Apollo 17 through the Carnarvon Tracking Station at a ground elapsed time of about 52 minutes 20 seconds, roughly 27 minutes from now.

PAO This is Apollo Control now 32 minutes after the liftoff of Apollo 17 and we have loss of signal with the spacecraft, we will be reacquiring through the Carnarvon Tracking Station in about 20 minutes. And from the President of the United States we have the following message to the crew of Apollo 17. The message reads: As you set forth on the final Apollo expedition to the Moon I want to have my personal best wishes for a successful mission and safe return. I am sure your voyage, your scientific exploration, will be the crowning achievement in a program which has expanded man's horizons, brought great credit to your country and lifted the spirits of people all over the world. God speed to you all. Signed Richard Nixon. The flight Dynamics officer, continuing to process tracking data, following orbital insertions, reports that there is a small amount of out of plane error showing up in the orbit. This is believed is due to a small error in the instrument unit of the Saturn thrid stage. However, the orbit is very close to nominal, about 90 nautical miles by 93 nautical -

END OF TAPE

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PAO However, the orbit is very close to nominal - about 90 nautical miles by 93 nautical miles. And, we look very good, both with respect to the spacecraft and with respect to the Saturn 3rd stage which must perform that burn putting Apollo 17 on its trajectory toward the Moon. At 34 minutes, this is Apollo Control Houston. This is Apollo Control. The post-launch press conference at Cape Kennedy is scheduled to begin at 12:33 central standard time, 1:33 a.m. eastern standard time. Again, that time 12:33 central standard time, 1:33 eastern standard for the post-launch press conference at Cape Kennedy.

END OF TAPE

PAO Control at 51 minutes into the flight of Apollo 17 and we're standing by to reacquire the spacecraft through the Carnarvon, Australia, tracking station. One of the things the booster engineer will be looking for when we reacquire them and get good log on the data will be the Saturn 3rd stage instrument unit. Looking at one brief bit of data before we lost signal, it appears that one of the four batteries in the instrument unit had a very high current drain on it. We will be looking closely at that to see if it was simply a telemetry problem or if, in fact, that battery does have some problem. And we should be about 15 seconds from reacquiring.

SC Hello, Houston, how do you read 17?

CAPCOM 17, read you loud and clear.

SC Hey, we're going real well up here, Bob.

Have no significant anomalies as yet and we've just about completed our part of the insertion checklist. Gene has his SCS check yet and Ron's got some P52 numbers for you and the only thing I've seen so far is some spurious master alarm without caution and warning that seem to be associated with moving switches on panel 2.

CAPCOM Okay, can you get a sudden (garble) switches anywhere, anytime they switch it on?

SC So far it's been fairly random. Some that I remember is the secondary cooler loop evap switch, the lamp test switch, let's see - I think I got one with the TEMP and auto switch. Gene got one doing something - I can't remember exactly what it was.

CAPCOM Okay. Jack, we're standing by for that P52 data. We've only got about a 4 minute - or a 5 minute pass here. We'll take the P52 data and I got a few updates for you.

SC Okay, 52 data is coming. NOUN 71 is 24 and 30, 905 is .01, 993s are plus .080, plus .029er, plus .018, and retort at 3525.

CAPCOM Okay, we copy that. Okay, while we're filling in some here, you might want to know this, Jack, your sunset and sunrise times in the launch checklist are all off by 8 - approximately 8 minutes and 30 seconds. That every - sunset and sunrise will occur about 8 minutes and 30 seconds sooner than in the launch checklist. That's an approximate number. Okay, we got you.

CAPCOM Okay, and on page 2-17 of the launch checklist, you're going to want to delete all reference to Honeysuckle, AOS and LOS, and delete all reference to Canary's AOS and LOS.

SC Willco.

CAPCOM And we want to add an Ascension pass AOS, an

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Ascension one plus 54 plus zero zero, and Ascension LOS will be 020016.

SC Okay, Bob, you're going to have to repeat that.

CAPCOM Okay, stand by. Let me give you a page. On 2-17 - let's go to Hawaii AOS first of all. Hawaii AOS on page 2-17. AOS is 01 plus 17 plus 24. Hawaii LOS 01 plus 22 plus 4 minor.

SC Gotcha. Now what about the Ascension.

CAPCOM Okay, here I'll give you the Ascension again now. AOS 1 plus 54 plus 00. Ascension LOS will be 020016. Over.

SC Okay, I got those. Hawaii is 1 plus 17 plus 24 and LOS is 1 plus 22 plus 49, and Ascension is AOS 1 plus 5400 and LOS 2 plus 0016.

CAPCOM Roger, Jack, good copy. And booster's looking good down here and you look good.

SC Okay, and I'll do a better job of itemizing those switches. We were pressing pretty hard and I'll be able to go back and get most of them, I think, and we'll keep an eye on it on the master alarms.

CAPCOM Roger, Jack, we understand, and I think we copied most of what you said there and we're working on it.

SC Okay, Bob, other than that master alarm, all is well on America and I understand the booster is looking good to you.

CAPCOM That's (garble).

SC And Bob, let me add that not - we did get spurious master alarms without switch movement, but many came with switch movements. We've had about seven.

CAPCOM Okay, understand.

SC And that was only after insertion.

CAPCOM Seven time that you heard (garble)

SC Oh, we were paying attention to a sunset that was the biggest - or sunrise or something that we saw. It was the biggest rainbow I'd ever seen.

CAPCOM Beautiful. We can't wait to hear what you had to say about that ignition on the S2. It sounded pretty spectacular.

SC Well, I just let it be said that that was

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quite a booster ride and when we get a chance a little later, I'll just tell you about it.

CAPCOM We're about ready to lose time here. You're looking great, guys, and we'll pick you up in Hawaii here shortly.

SC Okay, we're looking at the deserts of Australia right now and again everything is good on board.

CAPCOM Roger, pick you up at 1:1724.

SC Gotcha.

PAO This is Apollo Control. We're coming up now one hour after liftoff for Apollo 17. And as you heard CAPCOM Robert Overmyer reporting to the crew that everything looks good including the Saturn 3rd stage. Apparently the indication we had of a possible battery problem in the instrument unit nothing more than a bad bit of telemetry there. When the booster engineer got a good hard look at the telemetry on this pass, he reported everything looked good. We are ready at this point to begin the post-launch press conference at Cape Kennedy and we'll switch to Cape Kennedy and stand by for that press conference

END OF TAPE

PAO This is Apollo Control. 1 hour 25 minutes after lift off. During the postlaunch press conference at Cape Kennedy, we had a short acquisition with the crew through the Hawaiian tracking station. During that period of conversation, and during that period of monitoring the systems on the spacecraft and the launch vehicle, we found that the situation was essentially unchanged. That is both vehicles now looking good; the spacecraft and the launch vehicle. And we're progressing toward a normal translunar injection. 1 hour 46 minutes 50 seconds from now. The crew has discussed one unexplained series of events. It appears that when certain switches are cycled or moved on panel 2 which is the main panel in front of them, the center panel of the spacecraft, they're getting a master caution and warning signal. A light comes on - a tone comes on. This is to attract the crews attention that something may be wrong and the normal procedure is then to look at another matrix of lights which would zero them in on the problem. The light - the system or the subsystem or particular area being monitored, or which had the problem would light an individual light. However, when they go to this other matrix of lights, they find that none of them are lighted. This is leading the crew and the flight controllers here in mission control to believe that they are getting an SP signal to the master caution and warning, when in fact nothing is wrong. We don't have any further explanation for the problem at this point. We will continue to look at the data and particularly during the translunar coast, we think we'll get a good long time to look at things in detail and try to find out precisely what is happening. At this point however, the problem presents no concern and one of the more likely explanations - possible explanations that's been advanced is perhaps some contamination in some switches. We did accumulate some taped conversation during the press conference with the crew. We will replay that for you now and then stand by for acquisition of signal over the United States.

SCHMITT Hello Earthlings. We're back with you.

CAPCOM Roger, Jack. Read you loud and clear, how us?

SCHMITT Loud and clear, and no change systemswise that I've seen.

CAPCOM Roger Jack. Any more master alarms?

SCHMITT We had one when Ron's - looked like his neck ring hit panel 2.

CAPCOM Okay. Sounds like we had something loose on panel 2, huh?

SCHMITT Yeah. I don't know - it may be annoying but so far it doesn't seem to be a problem.

CAPCOM Roger. Just for your information. Everything is looking outstanding and no problems, we're taking a look at the data at Hawaii and we'll make a Go/No-Go decision about 60 seconds after acquisition at Goldstone, but there's nothing right now to lead us to believe that zero opportunity will be required.

SC Okay, Bob, understand that we are prepared, however, spacecraft other than those master alarms is looking very good. We got the docking probe extended. The SCS reference data 2 check is complete.

CAPCOM Roger.

SC Okay, Bob, I just remembered another switch that I think gave us a master alarm was H2O quantity indicator.

CAPCOM Roger, copy that, Jack. H2O quantity indicator. Roger. We're going to lose you in about 30 seconds, when you get over stateside here we're going to take - take the dump on the data and we'll read it out real carefully so when you get TLC we ought to be able to see where that master alarm click is coming in to.

SC Okay, Bob and yell at me if you want anything done on the COMM with it's change in AOS and LOS and all that stuff.

CAPCOM Negative on that right now. We'll see you at 12859 through Goldstone.

SC Okay, 12859 Bob, we'll be there.

CAPCOM Roger Gene. Okay, Houston, we're back with you.

SC Okay, Bob we're still same as before and ready when you are for TLI.

CAPCOM Roger.

SC I can see the lights of southern California, Bob.

CAPCOM Roger, Jack.

SC We're going to be going a little bit south of that area.

CAPCOM Roger, your ground path looks like it taking you right up over the mid part of Baja, California.

SC Yes sir. I believe that. I bet you I can see Encinada right now.

CAPCOM Roger.

CAPCOM Yeah, Bob. I expect you'll probably be able to see the lights in Silver City too.

SC Well, I'm sure going to be looking for them, I'll tell you.

CAPCOM Jack, just for your information, you'll probably when you come up (garble) and you get over Mexico, you should be able to see all that bad weather that - that was giving us so much worry and had Tindall and New Orleans and everything all messed up this morning when I went through there. It was a pretty bad line of weather along there.

SC I assume it wasn't too bad. I think you made it didn't you?

CAPCOM Oh, yeah, I made it but I had to - you know I had to work at it. But it's a - I was worried about it getting down as towards Mila there after - you know if we had to scrub and go tomorrow night. Boy, I'm sure glad we got you off tonight.

SC Guess who else is.

CAPCOM I wouldn't believe that.

CAPCOM Parker can't make it back. He's got to come back on the Gulfstream, so you might have to have Young on for a while after we do a TLI.

SC Hey, you just wouldn't believe, Bob the light you can see in the west right now. It must be absolutely clear.

CAPCOM Roger, Jack. Sounds spectacular. Jack, people in the room here want to know if you've been down your checklist yet.

SC Oh, we got that out of the way in about 5 minutes.
Have we missed something?
CAPCOM There's a different checklist we're talking
about.
SC (Laughter) If you're talking about the flightplan,
yes.
CAPCOM Roger.
SC What a waste. If I'm not mistaken we must be
just south of Arizona now. Is that right? right Bob?
CAPCOM That looks real good. Yeah, you're over Mexico
there and looks like you're oh - maybe a hundred miles south of
the border there.
SC Okay. I'm pretty sure I'm looking up into
Phoenix-Tucson complex there.
CAPCOM Roger. Understand.
SC Beautiful. (garble) Yeah, the west is always
that way. I wish it was daylight so we could see Senora and that
country. That's spectacular, I'll bet you. (garble)
SC Bob, we're coming through a large - squeal
right now in the background.
SC Understand.
SC Okay, I think we got Gulf coast showing up now by
the band of lights, Bob.
CAPCOM Roger.
SC Okay, Bob, assume the booster is still looking
good and we'll be GO for a nominal TLI.
CAPCOM That's affirmative.
SC Okay.
CAPCOM And you're still coming up with a loud squeal.
SC Rog (garble)
SC Would you believe we are just south of Houston
now, Bob?

END OF TAPE

LAUNCH CNTL 17 are you receiving Houston now?
SC Sorry, Bob, it came up unreadable with the squeal that time.

LAUNCH CNTL Am I still squealing, is this Houston.
SC That's afirm, you're very loud, almost unreadable with the squeal. Al, why don't you give it the short count?

CAPCOM Geno, don't change anything, we think it's a ground site situation here and just stand by.
SC I believe it's in the VHF, Bob.
SC Okay, Bob, I'm not sure exactly where we are, but I'm looking out to an awful lot of lights on the horizon out there at 12 o'clock and an awful lot of lightening in the clouds out there.

LAUNCH CNTL Roger, we show you just about the middle of the Gulf, look out ahead and you're probably seeing the very tip of Florida there.
SC It looks like almost the entire Florida peninsula has got lights all blinded in somewhere.

CAPCOM How does my comm sound to you now, Gene?
SC Okay, give us a short count.
CAPCOM Roger, short count follows: Five, four, three, two, one. One, two, three, four, five, short count out.

SC Bob, you're all right now.
CAPCOM Okay. And can you give us a feel for what the final weather was at the Cape at launch.

LAUNCH CNTL Yeah, let me get that for you. The reason why we had that problem on the comm is we just handed over from Texas to MLA and you're going through MLA now and it's great and so we so we have a little problem with our Texas site.
SC Okay.
CAPCOM The television coverage had you all the way through staging very well in the S 2 ignition then and you went right behind a cloud for a while but they were tracking you pretty well.
SC Okay.
CAPCOM They also cut in for about a half minute or so and showed a view of the crowd in the just the available light from the booster and it stood out pretty well.

SC Okay, Bob, we're going right over Florida now, looking down at Miami, a beautiful view of the Keys all lit up and I just saw a shooting star right over Miami.
CAPCOM Roger.
SC That's a very very fine view of Miami, hard to believe.
CAPCOM I'll bet they sat there and watched you go.

SC Looks like we're right over the Bahamas
now, Bob.
CAPCOM Roger, I'll buy that.
SC Well, I'm not easily impressed, Bob,
but I'm certainly impressed by this one.
CAPCOM What's the CMP doing, we haven't heard
much from him. Is he at the other window?
SC He's crawling around looking for things
down in the LAV.
CAPCOM Okay, they want let you jam a window
tonight, huh, Ron?
SC Naw, I'll catch one here pretty quick.
CAPCOM Just a reminder, if you haven't all
ready done it, there is no need to unstow the TV 'cause
due to this late launch there's just no site available.
SC Okay, Bob, we're not going to unstow it.
SC Bob, I don't - I guess there's no site
available for sometime, is that correct.
CAPCOM That's affirmative and if I can pull
one of you guys away from a window, I've got a TLI plus 90
pad.
SC Oh, I'd love to copy that, just a
minute.
SC Hello Houston, Apollo 17, how do you
read me.
CAPCOM 17, Houston, go ahead.
SC Okay, lost you there for a minute, we
had good signal strength all through that so figured it was
your problem.
CAPCOM Roger, we're just waiting here for
- you ready for the pad?
SC We were calling you and you missed us
so you might think about that. Ready for the pad.
CAPCOM Okay, it's a TLI plus 90 STS G&N 66953
minus 059 plus 188 ignition time 004 40 0148 minus 03518
minus 00001 plus 33782 roll is 180 073 003. Now 94 is
HA is not applicable, HP is plus 00201 33964 450 33808,
Sexton star is number 11, that's 11 3424 323. Stand by.
17, Houston, are you still reading me?
SC Okay, Houston, you read. We read you,
got you all the way through the trunion on Section star.
CAPCOM Okay, we'll have to wait and pick you
up at Ascension. We just had a keyhole pass at Bermuda and
a little bit of a pass at Vanguard.
SC Okay, I'll wait for you to finish that
and on the readback, okay.
CAPCOM That's affirmative. Standby, we've
got Vanguard, I can continue on with - after trunion the
Boresite star is not applicable, Jack, NOUN 61 plus 1329
minus 03200 10992 34904 GT 05G 024 3809. Want to read

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CAPCOM back that much of the pad, Jack?
SC Okay, Bob, it's TLI plus 90 pad STS
G&N 66953 minus 059 plus

END OF TAPE

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SC - It's - a TLI plus 90 pad SPS G&N -
66953 minus 059 plus 188 004 40 0148 minus 03518 minus 00001
plus 33782 180 073 003 HA is in a plus 00201 33964 454 33808
113424 323, boresight is in a plus 1329 minus 03200 10992 34904
024 3809. Over.

CAPCOM Roger, Jack. Good read back except burn-
time is 450 and not 454. And we'll be losing you here in about
a minute, so wait on the rest of that pad. Just a reminder
for Ron, we'll be standing by at Ascension for the next gyro
torquing. We might have a drift update on the IMU here.

SC Okay, he copied that. And we'll wait for the
rest of the pad.

CAPCOM Okay.

SC Burn time was 450 - just before you start
to cut out.

CAPCOM Roger.

CAPCOM 17, this is Houston through ARIA. How
do you read? Over.

CAPCOM 17, Houston, through ARIA. How do you
read? Over.

CAPCOM 17, Houston, through ARIA. How do you
read?

CAPCOM 17, Houston, how do you read through Aria?

PAO This is Apollo Control at 1 hour 51 minutes.
We're getting good telemetry data from Apollo 17 through one
of the Apollo Range Instrumented Aircraft out over the Atlan-
tic Ocean. Apollo 17 moving across the Atlantic now towards
Africa. And on the next revolution, at about this point, the
spacecraft will be on its way to the Moon during the Trans-
lunar injection maneuver. Ignition for that burn is scheduled
to occur 1 hour 21 minutes from now. During launch the flight
surgeon monitoring heart rates on the 3 crewmen recorded peak
heart rates of 130 for the Commander Gene Cernan, also 130
for Command Module pilot, Ron Evans, and 115 for Lunar Module
pilot, Jack Schmitt. We should be reacquiring the command
service module and reestablishing voice communications with
the astronauts in about 2 minutes from now through Ascension.

PAO This is Apollo Control. We should be
acquiring the spacecraft through Ascension in about 5 seconds
and reestablishing voice communications with the crew.

CAPCOM 17, Houston.

SC Go ahead.

CAPCOM Roger, you're back with us. I'll finish
up that TLI plus 90 pad.

END OF TAPE

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SC Go ahead.
CAPCOM Roger, you're back with us. I'll finish up that TLI + 90 pad so we can talk a little here if you want.
SC Go ahead.
CAPCOM Okay. Set stars are Sirius and Rigel. Hour line is 318148358. There will be no ullage. Okay, down at the bottom of the pad we've got P37 for liftoff plus minor. GET is 00900. Delta VT 4897. Longitude minus 175. GET at 400K 03349. Over.
SC Okay, Bob. Sirius and Rigel 318148358. No ullage. 009004897 minus 175 03349. Over.
CAPCOM Okay, Jack, good readback.
SC Okay, Bob, we had the usual up here - a spectacular sunrise - and Gene wants to talk to you.
SC I've got some numbers around P52 for you, Bob.
CAPCOM Okay, standing by to copy. Go ahead.
SC Okay, NOUN 71 were stars 22 and 24. NOUN 5 are all balls. NOUN 93s are all minus. They're in 00037, 00007 and 00021. That's minus 37, minus 07 and minus 21 and they were torqued at 151:40.
CAPCOM Okay, we copy.
SC Bob, we're over what might be intermediate to low stratals that have a very strong crinoidulation pattern - pulling out some geological terms here. I don't think I've ever seen anything like it flying.
CAPCOM Roger.
SC Looks like about a north/south lineation with a very strong crinkling roughly east/west.
CAPCOM Roger, we'll copy that. It's interesting. You know, you're just directly over that south Atlantic area. Your pass just kinda kept you going right between the Africa and South America - right dead center all the way. And, 17, just for your information, we've searched all the data we can and we cannot find anything wrong with the spacecraft or the booster at all. Everything is looking real fine and the only problem in the air is that those master alarms that you have reported - we're not able to tie in anything common yet to any of those things either.

SC Okay, Bob, we have not had any for quite some time, I think, since the last time we talked to you about them.

CAPCOM Roger, I understand. We'll probably get a good workout on that after TLI and try and track it down a little more.

SC Okay, but also, we have not really been doing much switching since the insertion checklist was complete, either.

CAPCOM Roger, understand. Got you glued to the windows, I guess, huh?

SC They are interesting, I'll say that. Well, I certainly am, Bob, and again there's a big - a continuous intermediate cloud deck, I think. It has patterns comparable to what I've seen on pictures of ice flows. (garble). Pack ice, I should say, pictures of pack ice in the Antarctic.

CAPCOM 17, Houston. We've got two questions concerning the master alarms. One, do you get the master alarm on the LEB also; and two, do you get the tone with the master alarm?

SC We did get the tone. The master alarms were on both panel 1 and panel 3. I can't tell you about the LEB right now. Maybe Ron can. No, I didn't pay that much attention.

CAPCOM Okay.

SC Hey, Bob, there was something interesting, I want to get around to tell you. The mission timer down in the LEB when Ron went down there to get things squared away, was about 15 seconds or so behind all the other clocks.

CAPCOM Roger, we'll copy that.

SC Okay, and we reset it, resynched it, and it's been running okay. I don't know whether that's a clue to anything or not, but apparently it happened either during launch or somewhere before we got down there right after insertion.

CAPCOM Okay, we're going to lose you here in about 9 seconds. Your GO is looking great and we're working on it and if you get another MEV, will you check the LEB board?

SC Yes sir, I sure will do, Bob. We'll see you. What's our next DOI?

CAPCOM Stand by. Carnarvon at 2:25.

SC Thank you.

PAO This is Apollo Control. Apollo 17 now over the horizon from the Ascension site - will be reacquiring in about 25 minutes through Carnarvon. And, as you heard CAPCOM Robert Overmyer advising the crew, we've been getting a good look at all the data, and spacecraft launch vehicles look fine. No discernable problems. Gene Cernan did mention one anomaly and that was the mission timer. One of the - one of the numerous clocks aboard the spacecraft which was running about 15 minutes slow - and someone said it appeared that it happened either during the launch phase or shortly before they got down to take a

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look at it in the lower equipment bay. No explanation for that one at this point. And we show now 1 minute - 1 hour, rather - 11 minutes until ignition for the translunar injection maneuver, the burn with the Saturn 3rd stage which will place Apollo 17 on its trajectory toward the Moon. Ignition time and still holding at about 3 hours 12 minutes 35 seconds ground elapsed time, and that burn will be about 5 minutes 45 seconds in duration, but we don't have the final calculated time from the flight dynamics officer which will undoubtedly vary somewhat from the premission flight plan time. At 2 hours 2 minutes this is Apollo Control Houston.

END OF TAPE

PAO This is Apollo Control, 2 hours 25 minutes. Apollo 17 now approaching the west coast of Australia. And we'll be reacquiring the spacecraft in about 35 seconds. During this pass over Carnarvon we expect to pass up the first set of numbers to the crew that they'll use in the translunar injection burn to put them on their trajectory toward the Moon. That maneuver is scheduled to begin at 47 minutes from now. And we have acquisition of signal a little bit early.

CAPCOM 17, Houston. How are you going?

SC Well, we're pretty good. Your wavery a little bit on signal strength.

CAPCOM Okay. We've got a TLI pad anytime you're ready to copy it, Jack.

SC Okay. Let me get rid of some of - Ron, I'm putting that right underneath you.

CAPCOM And guys, we'd like P00 and ACCEPT please.

CAPCOM Your CSM state vector if you'll give us P00 and ACCEPT.

SC Got P00 and ACCEPT. Okay, let me have my favorite pad.

CAPCOM Okay, here's the TLI pad. Time base 6
302 57 180 312 000 551 Delta VC is 10359er 6 35582 000 345 040,
extraction will be at 300 165 320 3120 3060 5710, Yaw is 0. Ejection
time 4 plus 3 9er plus 00. Over.

SC Okay, Houston. Here's your TLI.

302 57 180 312 000 551 103596 35582 000 345 040 300 165 320 3120
3060 5710 000. Ejection time 4 plus 39er plus 00.

CAPCOM Good readback Jack, and we'd like OMNI Charlie.

CAPCOM And it's your computer and you've got your state vector.

SC Okay, you've got OMNI Charlie. And Bob we had almost a completely weather free passover Africa and Madagascar. And the scenery both aesthetically and geologically was something like I've never seen before for sure.

CAPCOM Roger.

SC Got odds and ends on the tape and quite a bit on the film.

CAPCOM Roger, good show. Are you saying that you didn't have any weather over that southern Africa there?

SC Not very much. Barely broken clouds in some places. Most of the countryside was clear.

CAPCOM Roger.

SC There were patterns like I haven't even seen in text books. Maybe I haven't been looking enough but some of the dessert and grassland patterns were - had the appearance of ice crystals on most except on a megascale here. Ever looked at ice crystals in sand.

CAPCOM Roger.

SC Or better yet, ice crystals on your car window when you get out early in the morning up in northern areas.

CAPCOM Roger. And just be advised that we'll be standing by for the Go/No-Go for power arm when you get to Hawaii and we'll be giving you a Go for TLI about that time.

SC Okay, and we'll be ready.

CAPCOM And Ron, on the launch checklist, on 2-25 on the manual and nominal S-IVB TLI 1, add 34 degrees on the nominal pad for all the pitch angles, and on the manual pad add 34.5 degrees to all the pitch angles and you'll have it right.

SC Okay, Bob. (garble) Okay, we'll just add 34 to the nominal and 34.5 to all the manual ones.

CAPCOM And you'll want to do that on your cue card Ron.

SC Yeah, that's arfirm.

CAPCOM And we're about ready to LOS, so I'll see you in Hawaii.

SC Okay, Bob.

CAPCOM 2 plus 50 in Hawaii.

SC Okay, 50 and we'll be into our TLI checklist and we'll be ready for Power arm.

CAPCOM Okay.

PAO This is Apollo Control. We'll be reacquiring the spacecraft in about 18 minutes. And during that passover Carnarvon, and we've passed up the numbers to the crew they'll use in the translunar injection maneuver. The burn is targeted to last 5 minutes 51 seconds with a change in velocity of some 10 359 feet per second. Accelerating Apollo 17 to the required speed to get it into an orbit that will intercept the Moon. And the time of ignition, 3 hundred 3 hours 12 minutes 35 seconds and we're showing an ejection time of 4 hours 39 minutes. The transposition and docking maneuver which preceeds ejection, is somewhat fluid in that it's done when the crew and mission control are ready following translunar injection. However, from the projected time for ejection, it would appear that transposition and docking will occur about 25 to 30 minutes ahead of the nominal flight plan time. And we're now 39 minutes away from the scheduled ignition for translunar injection. At 2 hours 34 minutes this is Apollo Control, Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/7/72 0224 CST 2:49 GET MC-55/1

PAO This is Apollo Control at 2 hours 49 minutes. We're standing by now to acquire radio contact with Apollo 17 through Hawaii. During this Hawaiian pass we're getting another good look at spacecraft and launch vehicle systems. The last look we had through Carnarvon everything looked very good. Flight Director, Gene Kranz, going over the status for these flight controllers observed that there appeared to be no problems that would interfere with TLI and we expect to have a normal translunar injection, about 23 minutes from now as Apollo 17 completes its stateside pass and moves out over the Atlantic Ocean at the start of its third revolution.

SC Houston, this is Apollo 17, go ahead.
CAPCOM Hey, Ron, you're sounding great. Good voice here.

SC Golly, we've got things all set up here and we're kind of standing by for logic check whenever you guys can give us a go.

CAPCOM Roger, as soon as we get some TM in here, we'll give you a go.

SC Okay.
CAPCOM 17, Houston. We're ready for the logic check.

SC Okay, Bob. Okay, six arm breakers are closed.

CAPCOM Roger.

SC Okay, and logic 1 is on market and logic 2 is on market.

CAPCOM 17, you're go for PYRO ARM.
SC Thank you, understand go for PYRO ARM.
CAPCOM 17 - -
SC Say, Bob, in case you're interested there - all through the night side pass here - there's a - quite a strong - well - stronger than I would have ever expected - horizon glow off to the north. I suspect that, I think that Gene said awhile ago that it's around on his side also.

CAPCOM Roger. Guys, I've got the word you wanted to hear, you are go for TLI - you're go for the Moon.

SC Okay, Robert. I understand. America and Challenger with their S-IVB are go for TLI.

CAPCOM That's affirmative.
SC You're a sweet talker.
CAPCOM We try to please here, Gene.
SC You know, somehow Bob, I knew you were going to say that - that we were go - and that you try to please.

CAPCOM We've been working together too long, huh?
SC Not long enough, yet.

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CAPCOM And, 17, Houston. You're about 1 minute from LOS and we'll pick you up at Goldstone at about 3 hours and 00 minutes and that's only a couple of minutes prior to time base six start.

SC Okay, Bob. We'll be with you.

CAPCOM Roger.

SC Bob, that glow is actually above the horizon, just in case you're curious. I can see stars below the top of the glow - down closer to the Earth.

CAPCOM Roger, Jack.

END OF TAPE

CAPCOM 17, Houston, we're with you again and
you're looking good.
SC Okay, mighty fine, Bob.
SC And, Bob, we've got the piles ironed
out.
CAPCOM Roger. And you can expect some different
OMNI calls as we go LOS and AOS again.
SC Okay, I always expect that, Bob.
CAPCOM Roger.
SC And it's down on time.
CAPCOM Roger.
CAPCOM And it shows time bay 6 right on time,
Gene.
SC Okay.
CAPCOM We'd like OMNI Delta, Please.
SC Okay, you've got it.
CAPCOM Roger.
SC I'll just switch, Bob, I won't give you
a call.
CAPCOM Right.
SC Sup light was out on time.
CAPCOM Roger, Gene.
PAO This is Apollo Control at 3 hours
4 minutes. We are now some 8 minutes away from ignition.
Everything's looking good for the translunar injection
maneuver, the combined S-IVB Saturn third stage and the
spacecraft with an orbital weight of three hundred eight
thousand two hundred ninety eight pounds at the start of
this maneuver.
SC I'll check, Bob.
CAPCOM 17, Houston, go ahead.
SC I was just checking with you, you're
so quiet down there we almost forgot you were there.
CAPCOM Roger. Don't wanta forget me. We're
just watching everything, we can't find anything wrong,
so we're just trying to keep quieter.
SC Okay, Bob, we're watching here for
B tanks pressurized.
CAPCOM Roger.
SC Gotta look for the good things rather
than the bad.
CAPCOM Well, that's good when we don't find
anything wrong.
SC Can't agree more.
CAPCOM 17, the chilldown is in progress and
the tank pressures are looking good.
SC Okay, Bob, looking good here.

END OF TAPE

CAPCOM 17, Houston, you are GO at 3 minutes prior to ignition, you're looking good, and we're going to have a ARIA coverage all the way through the burn until the session.

SC Roger, understand, Bob, 5710 ORDEAL operate..

PAO And we're coming up now on 2 minutes until ignition. This burn, again, will be a 5 minute 51 second maneuver. The S-IVB engine, delivering about 225 000 pounds of thrust, and it will be increasing the spacecraft velocity in the current state of about 25 000 feet per second up to about 35 585 feet per second.

CAPCOM Roger, we confirm it.

SC SEP light on at 3:06.

CAPCOM Roger.

PAO And booster reports the ullage engines are on. This is to settle the propellants in the S-IVB prior to ignition. We are at 53 seconds from ignition.

CAPCOM 17, you're looking great on the final status check here and your're GO for TLI.

PAO 20 seconds now to ignition and we're maintaining communications with the spacecraft through one of the ARIA, Apollo range instrumented aircraft.

SC Roger.

PAO 10 seconds.

SC The light is on and we have ignition. And, very faintly we copy the crew reporting S-IVB ignition and that's confirmed by the telemetry and booster reports the thrust looks good on the S-IVB.

CAPCOM 17, Houston, you're looking good and the thrust is GO.

SC Roger (garble). We go on board in 20 seconds.

CAPCOM Roger.

PAO And telemetry data from the Saturn instrument unit shows the velocity increasing up now to 26 000 feet per second, beginning to climb ever more rapidly. This burn was initiated at an altitude of about 97 nautical miles above Earth, and when finished, the spacecraft will be at about 150 miles above Earth, and on its way to the Moon, some 213 000 miles nautical miles away.

SC One minute, Houston, inclined and we're GO.

CAPCOM Roger, Gene. We can barely hear you through the ARIA but you're GO.

SC You have a reasonable signal here, but you are unreadable.

PAO Very weak voice communications and booster says the data is now static but at last look everything looked normal.

SC (Garble) 145.

CAPCOM 17, Houston, we can confirm PU shift and you are GO.

PAO That was CAPCOM Robert Overmyer confirming

to the crew that our data showed the Saturn shifting its propellant utilization for a most efficient utilization of the propellant.

SC Okay, Houston, 230 in the blind we're still GO.
CAPCOM Roger, 17, you're GO, looking great.
SC Okay, Bob, got that. Understand we're GO
from the ground and it's a good ride although it's rumbling
around a little bit.
CAPCOM Okay.
PAO Coming up now 3 minutes into the burn and
velocity approaching 30 000 feet per second.
SC 3 minutes and we are GO.
CAPCOM Roger, Gene.
SC Bob, we're going to TLI right through sunrise.
CAPCOM Roger, understand.
PAO Gene Cernan reporting the TLI burn has taken
them out of darkness and into sunrise now and we're showing a
velocity of 30 463 feet per second.
CAPCOM Roger, 17.
PAO Apollo 17 now about 107 nautical miles above
Earth and continuing to climb ever more rapidly. 4 minutes and
30 seconds now and everything continuing to look good. Apollo 17
at a velocity of 32 000 feet per second.
SC Bob at 430, you're still reading.
CAPCOM Roger, how do you read me? You are GO
(garble)
SC Okay, we got you that time. Understand we're
GO on the ground and we're still GO here and we're TLI right
through a sunrise.
CAPCOM Understand.
PAO 5 minutes now, less than 1 minute to go, and
booster engineer reports that we're very close to the nominal
predicted shutdown time.
CAPCOM 17, Houston, your burn time is nominal.
SC I understand burn time nominal.
PAO Shutdown time now in about 21 seconds. Show-
ing a velocity of 33 000 feet per second. Altitude now approach-
ing 150 miles.
SC Cutoff at 52. Did you read the DSKY?
CAPCOM We don't have the DSKY - you have to read it
to us, Ron.
SC Okay, VI is - I got a 00 and a 00 and a 995
VIS. 35573. is at plus 9. And, Bob, the EMS is minus -
the EMS is minus 19.4 minus 19.4.
CAPCOM Roger, we copy that.
SC And it was an auto cutoff - auto cutoff on
time.
CAPCOM Understand a guided cutoff on time. Looking
great.

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SC And I am watching tank pressures - tanks are
venting, the tanks are venting.

CAPCOM Understand. The tanks are venting.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/7/72 CST 0256 GET 3:20 MC 58/1

PAO Well, we're still getting communications through the Apollo Range instrumented aircraft. We'll be picking up through Ascension shortly, at which time we'd expect the communications to improve, the noise to drop off. From Gene Cernan's report, also from the reports from Ron Evans, it appeared that that translunar injection was extremely close to nominal. The crew read a cut off time of 5 minutes 52 seconds. The premaneuver prediction was 5 minutes 51 seconds. And the cutoff velocity appeared to be very, very close to the planned normal. Booster engineer, Frank Van Rosilier reports the booster cutoff appeared to be exactly normal. And booster engineer now predicting that the maneuver to separation attitude will begin in about 3 hours 33 minutes 27 seconds.

SC Okay, Houston. How do you read?
CAPCOM 17, Houston we'd like OMNI Delta.
SC Okay, I fixed it up a little bit. How do you read now?
CAPCOM Read you loud and clear.
SC Okay, I hope you got all that. It was a beautiful burn right through sunrise. Did you get the numbers?

CAPCOM Yeah, we copied your VI and EMS numbers and we've got a number for you - maneuver start time will be at 3 plus 33 plus 27.

SC Okay, we got you. Maneuver at 3 33 27.
CAPCOM That's affirmative, Jack.
SC You guys didn't tell us we couldn't see anything going through the sunrise.

CAPCOM (Laughter) Roger.
CAPCOM 17 Houston, we're making plans here for the spacecraft sep time of 3 plus 43.

SC 3 plus 43. Roger.
CAPCOM 17 Houston, we're copying cabin press of 5.9 this time.

SC Roger. We just got it, Bob.
CAPCOM Okay.
SC Thank you.

PAO This is Apollo Control at 3 hours 30 minutes. The Flight Dynamics Officer has just reported that -

END OF TAPE

PAO This is Apollo Control at 3 hours 30 minutes. The flight dynamics officer has just reported that initial tracking, following the translunar injection burn, shows the spacecraft to be on a very nominal trajectory, and a relatively small midcourse correction indicated at this time. The pre-burn prediction on that first midcourse correction was around 5 feet per second and we expect that that will be updated as we get additional tracking following the burn. In about 3 minutes the spacecraft should - the launch vehicle should be - begin maneuvering to the proper attitude for separation and we're predicting separation to occur at about 3 hours 43 minutes - or about 13 minutes from now.

SC Frame 65 for the LNPS mag, November, November.

PAO About 10 seconds now until the Saturn third stage begins maneuvering into the proper separation attitude. And booster engineer reports from telemetry data that the booster has begun maneuvering into the proper attitude for spacecraft separation.

SC Okay, we are maneuvering, Houston.

CAPCOM Roger, we're watching it.

SC Now we've got a few very bright particles or fragments or something that go drifting by in the maneuvers.

CAPCOM Roger, understand.

SC There's a whole bunch of big ones on my window, - just bright - it looks like the 4th of July on Ron's window.

SC Yeah, now you can see some of them have shape. They're very jagged, angular fragments and they're tumbling.

CAPCOM Roger, look like fluid of some sort?

SC Not to me, they look like pieces of something.

CAPCOM Roger.

SC They're very bright.

CAPCOM Jack, we'd OMNI copy Charlie.

SC Bob, for the most part, these fragments are not - or are tumbling at a very slow rate. I tried a couple of pictures of them, different settings, you may get an idea of what at least, the patterns look like.

CAPCOM Roger, I've got you. We're all ears on these fragments. Do you think you can figure out what they might be?

SC Well, you know - I don't know - there are a number of possibilities. If you had some kind of a - I got the impression that maybe they were curved a little bit as if they might be a - off the side of the S-IVB - and that's a wild guess -

SC Okay, I see (garbled) logic is -

SC Ice chunks, possibly, or maybe there's paint coming off of it.

CAPCOM Rog. I noticed on one trip up the elevator last week there was a slag, I thought it was on the S-II but it might have been on the S-IVB. Looked like it was peeling. Maybe that's what you've got. And the S-IVB perforation plate -

SC (garbled)

SC Okay, and we'll set the old clock.

SC Okay, with the maneuver complete - the fragment field is - seems to be static except for very slight tumbling within the fragments.

CAPCOM Roger. Cut in.

SC Every once in awhile a fragment of considerably higher velocity goes across my window. But that's very rare.

CAPCOM Roger.

SC Hey, that's that field I wanted you to see out my window. Jack, do you see it now?

SC Yeah. Hey, Bob. At least, there's no apparent relative motion between fragments.

CAPCOM Roger. Understand.

SC I'll take 2 pictures about a minute apart if I can, and it will be frame 70.

CAPCOM Okay, frame 70.

SC And, Bob. You know, my impression is that they are - a - flat, flake-like particles, some may be 6 inches across and although there's no relative motion between the two, most of them seem to be twinkling and I think for the most part, they're all moving away from us.

CAPCOM Roger, Gene, thank you.

END OF TAPE

SC Okay, we've got 0180 and 0 on the old thumb wheel.

CAPCOM Roger, Ron.

SC Okay, trans control is armed. Controller number 2 is armed. Okay, SECS logic is closed, SECS arm is closed. Logic power is ON.

CAPCOM 17, Houston, you have a GO for T & D.

SC Okay, a GO for T & D.

SC Okay, the - we'll arm the pyros. And we 'll hit the GDC align.

SC And maneuvers complete. Okay, 0180 & 0 on the GDC. Okay, the Delta V is normal. The S-IV is okay. Okay, switches all set. Okay, we'll start the D E T. Diggy, tick, Houston, we're running at 59 30.

CAPCOM Roger.

SC Okay.

SC Okay, that's launch vehicle sep push button MC in auto. 6. Separation, Houston. Okay, check the (garble) okay. And check the other ones off. Okay, I'm going to start the - my God, look at the junk. Okay, that's 15 seconds. Pitch her up. Okay, we'll proceed on the - Okay, we've already proceeded, Jack. Okay, we've checked her out.

SC Houston, we're right in the middle of a snow storm.

CAPCOM Roger. It looks like Hadley Delta.

SC Hey, look at that booster. It's going to be bright as all get out.

SC And there goes one SLA panels.

SC Yes.

SC We're all okay. Long ways to go, yet. It's on the other side of the Earth, if the simulator is any good.

PAO Apollo 17 now in the process of turning around after having separated, blown the pyrotechnic charges that separates the spacecraft from the Saturn third stage.

CAPCOM Roger, bet you never saw the SLA panels on the simulator.

SC No, but we've got the booster and is she pretty. Challenger is just sitting in her nest.

CAPCOM Roger.

CAPCOM We're - we'd like omni bravo now, Jack.

SC Okay, plus X it now and see you later.

SC Okay.

SC Oh, can't see my COAS.

SC And Houston, some of the particles gone by the window fairly obviously seem to be paint.

CAPCOM Okay, we'll buy that.

SC Okay. There it is. Okay, changes the (garble). Got ATT rate 2.

SC Okay, Houston, you want the high gain?

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CAPCOM Roger, we're standing by for it and the angles as published on L3-3 should be good.
SC Okay.
SC Okay, it's flying pretty good.
SC Okay, we're in REACQ.
SC Houston, how do you read? We don't have a very good lock on here in REACQ.
CAPCOM Roger, Jack, we're reading pretty good in voice.
SC Okay, it looks like it's improving. It dropped off - signal strength dropped off and now it's picking up again.
CAPCOM Roger.
CAPCOM We're getting good signal now, Jack.
CAPCOM Jack, the high gain is looking good.
SC I'm guessing. I don't know - about a hundred (garble).
SC It seems to slew very smoothly so it looks all right.
CAPCOM Roger, Jack.
SC ATT 1 rate 2.
SC I can't tell you too much, Bob, from the center seat other than Captain America is very intent on getting Challenger at the moment.
CAPCOM Okay, Roger, I can believe that.
SC Yes, I'm coming in a little slow but we've got plenty of time.
PAO Ron Evans now at the controls of America. Now moving in for the docking with lunar module Challenger.
SC Now, while we're moving in here I can see a few chunks of that flaky material, possibly paint down in the SLA sort of bouncing around between the S-IVB and the LM.
CAPCOM Roger.
SC But so far -

END OF TAPE

CAPCOM Roger.
SC But so far LM looks very clean. Can't see anything abnormal from this view yet.
CAPCOM Okay.
SC I tell you, it's really stable out there.
SC Yeah, can you steer it alone, Gene?
SC Got one little chunk coming out - just came out of the SLA - spinning along axis and it looks very stable.
CAPCOM Roger.
SC Every once in a while a small particle flies off of it though.
CAPCOM How big of a chunk are you talking about, Jack?
SC Say again.
CAPCOM How big an item are you talking about?
SC Oh, I - reference to the thrusters, about the same diameter as the thruster on the left.
CAPCOM Oh, Roger.
SC That's how long it was, and about oh, 1/5th that thick or that wide.
CAPCOM Roger.
SC And I don't think it's more than 1/4 of an inch or maybe even less thick.
SC That same particle (garble) came by (garble) and it was spinning as it was throwing off pieces of itself.
CAPCOM Roger, we copy.
SC There's a small one come floating by and it looked like flakes. And I think I caught 3 of the 4 SLA panels going as we were maneuvering. I got one out the hatch window now. It's quite a ways out.
CAPCOM Roger.
SC It's tumbling in all 3 axis.
SC And I saw the 4th one out my side.
SC Area around the two spacecrafts is cleaned up pretty well by now. There's just a few fragments moving around.
SC Now she's coming in.
PAO The crew of Apollo 17 describing what appeared to be paint or possibly ice flaking off the Saturn 3rd stage. But somewhat puzzling at this point is just exactly what the flakes or particles that they're describing might be. And Apollo 17 in the process of docking with the lunar module. Preparatory to extracting the LM from the Saturn 3rd stage. This occurring at some 5300 nautical miles from Earth. And we're watching the spacecraft velocity drop off rapidly as the altitude increases rapidly. The velocity

PAO which at the translunar injection cutoff was
around 35 000 feet per second down to about 22 000.

CAPCOM Roger, Jack. Can you see now on that quad?
Is that what you're looking at?

SC Yeah, I'm looking right at it. And I got a good
view of the MESA, top anyway, it's pretty well covered, but it looks
all right also.

CAPCOM Roger.

SC All the antennas look good thruster quads all
look great. I can see all four of them a minute ago.

SC Okay, about 10 feet there, Gene. Stand by for
a barber pole.

SC MARK to G.

SC About now.

SC Capture instant. Okay, we're free rates look
pretty good.

SC Let's lock it together.

SC Ready. She's lined up, not bad.

SC Good.

SC Prime 1.

SC Mark it. Stand by.

SC Here she comes.

SC My gosh, Houston, we have a ripple fire, but
we still have number 8 barber pole.

CAPCOM Roger, we copy.

SC We've got a master - got a master alarm.

CAPCOM Roger.

SC We got most of the latches but Ed barberpoled
and B is great.

SC We checked both circuit breakers and they're
both okay.

SC We had one clear fire, maybe one or two latches
and then a ripple fire on the rest.

CAPCOM Roger.

SC And by the way, I had a good view in the ADT and
I can still look in there and it's very clean.

CAPCOM Roger.

CAPCOM Ron, we saw your master alarm, did you have any-
thing on the matrix light up?

SC No, not a thing I looked.

CAPCOM Roger.

PAO That appeared to be a repeat of the master
alarm has been reported several times previously by the crew. They
get the alarm light and tone, but when they look for the exact
location of precise indication of what's wrong it's not there, indi-
cating some sort spurious response by the master alarm to a problem
that doesn't exist.

END OF TAPE

SC Okay, Bob. We're going to go ahead and take a look at that docking malfunction before we push on here further to check this barber pole out.

CAPCOM Roger. We're looking some words up here. We'll be back with you in a second on that, Gene.

SC Okay, we're down on the checklist through the NES power breakers open.

CAPCOM Understand.

SC Houston, in case we didn't tell you it's (garbled) barber pole.

CAPCOM Understand, we have it. - Say, Gene, we don't think its a problem - we'll find out what it is when they get in. We think we should just press right on with the pipeline check list and keep going.

SC Okay, we concur with that. Okay, we'll press on, Bob.

SC Okay, Bob. We just got our master alarm when I went to the retrack prime, from 1 to off.

CAPCOM I have to recopy that. Looks like panel 2 is jinx up there, huh.

SC Okay, up to the heater number 3 went to auto.

CAPCOM I have to recopy that.

SC Okay, Bob. We're reading the DELTA P of greater than 4 and I'm going to open the pressure equalization valve now.

CAPCOM Roger. 17, we copy that.

SC Okay, the DELTA P is coming down, Bob.

CAPCOM Roger.

SC Dave, while you're watching that I just thought you'd be interested with the

END OF TAPE

CAPCOM Gene, while you're watching that, thought you'd be interested. We talked to some of our friends down at the Cape who watched the launch and they said you were aglow all the way until you faded into - you couldn't tell you from a star. They saw staging and they could just see you as a star way off in the distance until you faded out. Not a cloud in the way at all.

SC Beautiful. Okay, we're at 2 and we're monitored in for 3 minutes.

CAPCOM Okay.

SC And, Houston, while we're checking the integrity here, mag alpha Alpha, there's about 50 percent.

CAPCOM Mag alpha alpha, 50 percent. Roger.

PAO This is Apollo Control at 4 hours 12 minutes. The crew aboard Apollo 17 at this time pressing ahead with their preparations for separating the lunar module and command module, now docked together from the Saturn third stage. You heard some conversation earlier about an indication that all of the docking latches have not locked up. Now there are 12 of these latches in the docking mechanism, 6 of which are instrumented, and of the 6 that are instrumented, there was an indication that one of those may not have latched. However, we are confident that more than enough latches have locked up to assure a good solid dock, and for that reason the crew is pressing ahead with their preparations for separation.

SC Delta B change is less than .1

CAPCOM Three minutes and less than .1.

SC We are pressing on.

CAPCOM Rog, press.

PAO That report from Gene Cernan indicating that they have a good seal at the docking interface. Once the hatch is removed between the two vehicles, the crew will get a good look at all of those docking latches and they will be able to tell how many - if any of them didn't latch up. We're pushing ahead now for - for extracting the lunar module separating from the Saturn third stage at ground elapsed time of 4 hours 39 minutes.

SC Okay, cabin's at 4.8 now repress is about it.

SC Okay.

SC Oh, not yet, it's still getting a little bit.

SC That repress valve is kind of noisy.

SC Repress is all through, we'll turn that off.

Okay, Houston, the repress package is empty now and we're down to a Delta P of .2.

CAPCOM Roger, we copy that.

CAPCOM And 17, just be advised, you're going to have S-IVB non-propulsional vent start 4:18:27, you've got about 3 minutes on that.

SC (Laughter) Okay, thank you.

SC Yeah, I'll get 'em.

SC Okay, Bob, we seem to be holding Delta P at about .2, I suspect that's probably zero.

CAPCOM Roger, we copy that.

SC And the cabin pressure's about 4.5. You want us to wait till 5 psi for the emergency cabin pressure selects.

CAPCOM Negative on that, let's go ahead and just press on.

SC Okay. They should be both. Okay emergency register working.

SC Coming down though Gene, let's wait till it gets down a little less.

SC Yeah.

SC Yeah, straight up and down is both.

SC Up on 1, must be the non-propulsive vent that's banging. (laughter) here goes - look at all the stuff glowing again.

SC It's really glowing.

SC Your non-propulsive vent gives quite a glow.

CAPCOM Roger, Jack.

SC It looks like a rainbow.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/7/72 CST 3:56 GET 4:20 64/1

SC Prestressed package to fuel.
SC Now I take third string down a little
bit. (Garble) a lot better about 400?
SC 500 on the insertion. Now, they ought to
be closed off by now I think. Yes.
CAPCOM 17, Houston.
SC Go ahead.
CAPCOM Roger. Be advised, you don't have to
wait until 5 psi cabin to go and open the hatch.
SC Okay, we're not viable. We're pressing
on with it now.
CAPCOM Roger.
SC Okay, it looks like we're going to
maintain about 400 on the surge.
SC Good.
SC Okay, Houston. The hatch is coming out.
CAPCOM Roger.
SC (laughter) I don't know what you're
going to do with it.
SC Put it up here on the couch.
SC There we go.
SC Hey this is a lot lighter than it used
to be.
SC There's going to be a lot of happy people
down there, Bob. I haven't checked them all, but visually
they're all locked.
CAPCOM Understand, Gene, all of them are locked.
SC Let me give them a good check.
SC Yes, you'd better check them cause we
got a barber pole on that one.
SC Yes, here's one that slipped over.
SC What is the position of it?
SC 7 and (garble)
SC 7 and 9?
SC Hey, Bob. Maybe we aren't all going to
be so happy.
SC Go ahead.
SC Okay, 7, 9 and 10. The handle is flush,
the bungee is vertical, but the handle is not locked down
and a red button is showing and I can pull each one of them
back slowly, I haven't done anything with them, that's 7, 9
and 10.
CAPCOM Roger, we copy that. The handle is flush,
the bungee is vertical, but the handle is not locked down
and the red button is showing on 7, 9 and 10.
SC Check verb.
SC Okay, Bob. Bob, I just pushed the handle
on 10 home a little bit and it did lock, and the red button
is flush, so that leaves me 9 and 7.

APOLLO 17 MISSION COMMENTARY 12/7/72 CST 3:56 GET 4:20 64/2

CAPCOM Uh, Geno, go ahead and try the handle on 9 and 7 and if that doesn't work, toggle and refire starting with 9.

SC Okay, the handle, it doesn't work, I'll have to recock them.

CAPCOM Okay.

SC When you trip it do you cock it twice, does it take 2 cocks to make it go.?

SC Okay.

SC Okay, 9 cocked twice, it tripped. It is over center and locked.

CAPCOM Roger, how about the barber pole, now?

SC Okay, wait a minute, I've got - barber pole main A circuit breakers are in and gone to retract and it's grey.

SC Aha, that did it.

CAPCOM Roger.

SC Okay, Bob. Cocked 7 twice and tripped it and it's over center and locked.

CAPCOM Roger.

SC I think that takes care of them all.

CAPCOM Good show.

SC Okay, docking probe circuit breakers are out and extend retract is off. Does it belong on the probe? It's painted yellow and belongs on the probe.

SC Okay, Bob. The umbilicals are connected.

CAPCOM Roger.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/7/72 CST4:06 GET 4:30 65/1

SC Okay, Houston, 7 delta on the test meter is now reading 1.0. It jumped up to 2.6 and it is now back to 1.0.

CAPCOM Roger, we copy. That's good.

PAO This is Apollo Control at 4 hours 30 minutes. About 9 minutes from now the crew will be firing the pyrotechnic charges that separate the lunar module docked to the command module from the Saturn third stage, and springs will push the LM CSM back away from the launch vehicle at a rate of about 1 foot per second, and at ground elapsed time of 4 hours 52 minutes the launch vehicle will yaw to the proper attitude for an evasive maneuver of about 10 feet per second to be performed at a ground elapsed time of about 5 hours 3 minutes. This will increase the separation difference to assure no chance of recontact between the booster and the spacecraft on route to the Moon. On removing the hatch between the LM, the CSM, allowing the crew to get a look inside the docking tunnel, they found that 3 of the 12 latches had not locked up, but on manually recocking them and activating them, they latched up properly, which indicates that there's nothing physically wrong with the system. We would expect that the next time the 2 vehicles come together to dock that the latches will function properly.

SC Pretty good (garble) service.

SC Okay, Bob. The hatch is back in.

CAPCOM Roger, team.

CAPCOM 15, Houston.

SC Go ahead, Houston.

CAPCOM Roger. We've got some new angles here for you.

SC Stand by a minute and let me find a place to copy them. What kind of angles are they, Bob?

CAPCOM They're your noun 22 attitude maneuver for APS burn out of the hatch window. They're in the middle of the page L3-5.

SC Oh, okay.

CAPCOM Instead of 270 we want 274.

SC Wait one, we're not quite with you.

CAPCOM Okay.

SC Okay, I think I might see it, 3-7 go.

CAPCOM It's on 3-5, Jack, middle of the page there. Those noun 22's.

SC Okay, I take it back, 3-5, middle of the page.

CAPCOM Okay, you notice there's 3 angles there, 270, make that 274.

SC Okay, now can we change?

CAPCOM And, no the next one, the 129-A, change

APOLLO 17 MISSION COMMENTARY CST 4:06 GET 4:30 65/2

CAPCOM that to 164, and 4.3 on the YAW, change that to 0, it's close enough, 0 on the yaw.

SC Okay, we got them 274 164 00.

CAPCOM Roger, and the high gain angles that you've got on the flight plan are close enough, and should do.

SC Very good.

PAO Telemetry data now shows the crew loading the information into the spacecraft digital auto pilot in preparation for separation from the Saturn third stage. That should be occurring in the next minute or so.

END OF TAPE

CAPCOM That should be occurring in the next
minute or so.

SC Okay, we're 6 feet a second. Okay,
what it cut in?

SC Range 1.

SC Yes, I'll leave it at 10 feet (garble).

SC Okay, Mode 1 and set.

SC Because I had the 0180 0.

SC Stand by. We're aligning our GDC and
the next thing you'll pick up will be sector arm circuit
breakers. We'll give you a call on the logic.

CAPCOM Roger, Gene.

SC Okay, Bob, while we're waiting, balance
on the -

SC I see what you mean.

SC 2 and 02 flowing to fuel cell 3. Actually,
in all 3 fuel cells look pretty good to you?

CAPCOM Jack, the flows look just right for the
current.

SC Okay. Used to seeing them more or less
ligned up and I hadn't calculated any farther than that.

CAPCOM Roger.

SC 02 seemed a little higher H2, relatively
speaking.

SC Okay, that's pretty close. Verifies extra
Arm breakers are closed.

SC Okay, Houston, we're ready to come up
with the logic.

SC Okay, Houston, logic 1 is coming on
now and logic 2.

CAPCOM Roger.

SC And Houston, just to keep track of GMS
mobias check - that time was - went from 1 hundred to
1 hundred point 7 in a hundred seconds.

CAPCOM 17, we'd like to just verify on that
top line S-IVB LM sep circuit breakers. Both of them are
closed?

SC Okay, we'll verify them again. We double
checked them.

CAPCOM Okay, we just didn't hear your call and
want to make sure of that. Didn't want to miss anything,
here.

SC Okay, they are verified closed and Jack
just checked them again.

APOLLO 17 MISSION COMMENTARY 12/7/72 04:16 CST 4:40 GET MC66/2

CAPCOM Okay, you are GO for power arm and GO
for extraction.
SC Okay, GO for power arm, GO for power
extraction. LM extraction.
SC Okay, hold on the old pyros. Pyro A,
pyro B.
SC DVC servo power ECl.
SC Dredge control power is on.
SC Okay, both controllers are on.
SC Okay, I'll wait just a little bit on
that. You missed it all. What the hell have you done?
SC Okay, you missed another one. Push right
there. Yes.
SC Okay, my mark - the S-IVB LM SEP will come on.
SC Okay, and I'll back it off too - okay.
SC Okay, on my mark. S-IVB LM SEP 3 2 1
mark it. Okay, we got it.
SC Oh ho! Did we.
SC Here she comes. Yes, LM came with us.
SC Okay, we're CMC AUTO. All right. We've
got six tenths. It's all right. Okay, whoopee dee doo.
SC SEP's closed.
SC Okay, logic's off.
SC Fixed arm - breakers are open.
PAO This is Apollo Control,. America and
Challenger are on their own. LM injection occurred at
4 hours 45 minutes - that's Ground Elapsed Time - at an
altitude of 13 thousand nautical miles from earth.
SC Now we can go on and do the maneuver
pretty quick. This will be so far away you can't see it.
SC Hey, ready to maneuver?
SC Okay, CMC in AUTO caged. Away we go.
SC That (garble) wasn't as bad as the
original -
SC Yes.
SC Came right out mapping camera and pan camera
off.
SC Okay. Power's off.
SC Hey, Jack, hand me the Hasselblad.
SC I think we're bowing the right direction.
SC Yes, the Moon is - the Earth is - that's
good.
SC (Garble) powers off (garble).
SC The Earth just fills up window 5.
SC What do you have, zero in there? Hey,
I lost my watch. Turn ACC off. Yes. ACC is off. Whoo -
What a beauty. What a beauty. Yes, the Earth.

APOLLO 17 MISSION COMMENTARY 12/7/72 04:16 CST 4:40 GET MC66/3

SC I can't see the S-IVB. It's gone.
Look at that.

SC Yes, Matagascar and Africa. Got to
be. Yes, as soon as I - the S-IVB -

SC Hey, there's Antarctica. It's all full
of snow. Okay, you want to look?

END OF TAPE

SC Okay, do you want to look?
SC Yes, oh there it goes, there.
SC Looks kind of empty down there, Bob,
without the LM we're looking right up the dome of
the S-IVB.
CAPCOM Roger. We copy that. We're standing
by for your GO for yaw maneuver.
SC We can give them a GO for yaw, can't we?
We can see it.
SC Yes, you've got the GO on the yaw.
CAPCOM Roger, thank you, 17.
SC Looks like she came out of there clean
as a whistle.
CAPCOM 17, Houston. The yaw maneuver will be
starting in about 4 plus 52, a little less than 2 minutes
from now.
SC Okay.
CAPCOM Sounds like you are taking a picture of
that old dome out there, huh?
SC (laughter) Where'd the empty -
SC Here, are you using this?
SC Hey, there it goes, look at the aft
fire of the thing.
SC Yes, we can see it firing now.
CAPCOM Roger, 17. Yaw maneuver started.
PAO The Saturn third stage now maneuvering
into attitude for the APS evasive maneuver, a 10 foot per
second burn using the auxiliary propulsion system that
will assure -
SC The flare wasn't dramatic, but it
certainly did its job for us.
CAPCOM Roger, Jack. Preliminary data indi-
cates that you are about as nominal as you can be.
SC That's the way we'd like to keep it,
Bob.
CAPCOM You'd better believe it.
SC Okay, she's - as we're looking at it,
she's pitching up, she was looking right at us, we were
looking right at the dome and now she's pitching up. The
shroud around the IU's seem to be totally intact. It
looked like a super clean separation. I can't really
see where there's any paint or anything externally chipped
off the booster from here. We're beginning to pick up the
(garble). It's really a shame you don't have this whole
thing on TV, it's really quite a sight.
CAPCOM Roger, we concur with that.
SC The mylar and the gold coating on the
inside of the shroud is now visible, it's also intact.
It looks like you could use it again if you could get it
back.
CAPCOM It's got a job to do when it hits the
Moon yet.

APOLLO 17 MISSION COMMENTARY 12/7/72 CST 4:26 GET 4:50 67/2

SC Okay, Bob. We're almost looking at it
broadside now.

CAPCOM Roger.

SC Okay, she's spitting a little, looks
like the yaw maneuver may be complete.

SC We got a full view of the entire
J2 from here, and no kidding, Bob, the whole bird, the
shroud at the top, the IU, the separation plane down by the
S2, from here looks just clean as a whistle, all the way.

CAPCOM Roger, Gene, if you're happy, we'd like
a GO from you for the evasive burn.

SC Okay, you're going to burn on the
boosters plus the X axis, is that right?

CAPCOM That's affirmative.

SC Let's just get a picture or 2 here yet,
and then we'll give you a GO.

CAPCOM And Gene, it'll be about 7 minutes
until the evasive burn, 5 plus 03.

SC Okay, you have a GO. And for your
reference, it's frame 105, I started a few 250 millimeter
pictures of the S-IVB.

CAPCOM Roger, Gene.

SC And Bob, the entire sky, as far as I
can make it out through the hatch window is completely
filled with our twinkling flakes.

CAPCOM Roger, we copy that.

SC I saw a couple particles go by the
window a while back, and it looked a little bit like in-
sulation in that particular case, styrofoam insulation,
but it's flat flakes.

CAPCOM Roger, that.

SC That was right after we separated.

END OF TAPE

SC That was right after we separated from the
S-IVB.
CAPCOM Roger.
SC CSM sep, CSM sep, Bob.
CAPCOM Roger, understand.
SC Bob, I know we're not the first to discover
this, but we'd like to confirm from the crew of America that the
world is round.
CAPCOM Roger, that's a good data point. Have you
gotten a good look at any of that weather down there on the
Antarctic?
SC Ron's at window number 1, maybe he can tell
you a little about it.
EVANS You know it's real funny there, at Antarctica
the - you can see the snow but there isn't any weather at all.
All of the weather's around it in the water.
CAPCOM Rog.
SC That's where the moisture is.
SC I don't know what to think of (garble).
SC Can't see the U.S. at all.
CAPCOM 17, Houston.
SC Go ahead.
CAPCOM Look's like you've got a super conservative
CMP up there, we've run off some numbers, looks like you used
about 40 pounds of RCS on the T and D and you've used about a
total of 42 pounds RCS total, so we're hanging right in there,
beautiful.
SC Very fine, glad to here that.
SC Still a little bit too much, but that's not
bad. We'll be glad to leave all that extra, I hope, in the
service module when we get home.
SC It's in the Volkswagen pouch down there.
SC No, I'll change lens now.
CAPCOM 17, Houston, it's about 30 seconds from the
Evasive Maneuver Burn.
SC Okay. Here Jack, can you see it good?
SC Check the lens now. I took an F-22 stop.
SC There is goes, Bob.
SC There is goes, finally.
CAPCOM Roger.
PAO This is Apollo Control at 5 hours 5 minutes.
CAPCOM EMB burn is complete and the LOX dump will
be at 5 plus 24 plus 20.
SC Okay 5 plus 24 plus 20.
CAPCOM Roger.
SC It's going to be gone, I think, before we -
SC And, Bob, you can tell Frank to forget the
returning that phone call, I made to him a couple days ago.
CAPCOM Rog, understand.
SC All my questions are answered.
CAPCOM Think you've had enough booster briefings, huh?
SC Yep, I figure this is probably the best one
of all.

APOLLO 17 MISSION COMMENTARY 12/7/72 05:00 GET 04:36 CST 68/2

CAPCOM Frank said he'd guarantee all those S-IVBs
would be just as good as that one.

SC Okay, that's fair enough.

SC The S-IC and the S-II didn't put on a bad
show either.

CAPCOM That's right.

SC Houston, Magazine, November, November is on
about 1/23 right now.

CAPCOM Okay, Ron, magazine November November is on 1/23.

SC And, Bob we're on page 3-9 of the flight plan
now, we'll check the LM-CM Delta P, get the cabin fan filter in
we'll go over to check the systems checklist, get the primary
EVAP and a few odds and ends and starts off in our PGAs, how's
that sound?

CAPCOM Sounds like a winner, Gene.

SC Okay.

END OF TAPE

CAPCOM Sounds like a winner, Gene.
SC Okay.
SC I guess you saw that one, Houston. That had no caution or warning with it.
CAPCOM Roger, that master alarm?
SC Yes, sir.
CAPCOM How about the LEB?
SC (Garble) Ha. You caught me. I forgot to look. Keep after us, we'll get you that data for you.
CAPCOM Roger, Jack.
SC Gene's got his hands all over panel 2, which probably would have caused it.
CAPCOM Jack, we think that might have been a real one, due to the accumulator cycle with the O2 makeup flow going on there, held the O2 flow little higher for a - greater than 16 seconds.
SC Well, that's certainly a possibility. We didn't notice it looked upright at the time. But it- - sure that was the right time.
CAPCOM Well, we're kindly watching it here and (garble) feels it is.
SC Gee, I can't argue with him.
SC Okay, Houston, ready to deactivate the primary evaporator if you concur.
CAPCOM Roger. Jack we concur.
SC Okay, Bob. VHF simplex, ALFA's off.
CAPCOM Roger.
SC And we're gradually moving in to getting out of the suits.
CAPCOM Yeah, I bet you're looking forward to that.
SC Well, I'll tell you it's a different world without that old 1-G on you. The old suit's a little bit friendlier.
SC And, as you may have noticed, Bob, we've come to the end of the launch checklist.
CAPCOM That's affirmative, and we've put ours away for posterity. We also started with our TLI zero data that we worked so hard to generate.
SC Well, I'm just happy - didn't - use it. That view of the earth for a rev there was something I was looking forward to and was not disappointed.
CAPCOM That's great, Jack.
SC Bob, you've got a pretty good size storm over the north. I guess the northwestern coast of India, where it starts to wrap up around to the west. It's around out on the horizon, so I can't make out exactly where it is too well.
CAPCOM Roger.
CAPCOM Could we get a readout on the LM, CM Delta P?
SC Plus .4.
CAPCOM Roger, we copy that.
SC Bob, Antarctica is what I would call effectively just a solid white cap down on the -

END OF TAPE

SC White cap down on the South Pole. There's definite contact between the continent and the water, but as Ron said most of the clouds seem to be very artistic, very picturesque, some in clockwise rotating fashion but appear to be very thin when you can for the most part kind of see through those clouds the blue water below.

CAPCOM Roger.

SC The continent itself is the same color as the clouds but of course, more dense in a striking difference than any of the other white background around, because you can definitely see that contact with the water and with the clouds over the water.

CAPCOM Rog, understand. There'll be a comm switch over to Madrid here shortly, may break lock here in a few minutes here. Or a few seconds, really.

CAPCOM And you might watch your accumulator's going to cycle in about 20 seconds here, see what happen with the master alarm.

CAPCOM 17, Houston, how do you read through Madrid?

SC You're loud and clear, Bob, and could you give us our distance from the Earth?

CAPCOM Rog, I'm looking at the board, I'd guess at about 19 000 miles, want me to get it exact?

SC Just approximate's good enough.

CAPCOM 18 100, Fido says.

SC Okay, and I suppose we're seeing as 100 percent full Earth as we'll ever see, certainly as I've ever seen, it appears to be - it may be a little bit - a little bit of a terminator, way out to the well to the East out beyond Australia and beyond India, but beyond that it's about 99 percent pure.

SC Bob, it's these kind of views - these kind of views that stick with you forever.

CAPCOM Roger, Gene.

SC We've got a I guess probably the continent of Africa dominates the world right now, it's covering oh the upper third - upper western third of the world. We can see the Sinai, we can see up into the Mediterranean, we can see across the Mediterranean although we can't quite make out the countries up there, we can see across into India. I can catch a glimpse of Australia out in the far horizon. Got Zanzibar on the southern tip of Africa, the cape down there just almost directly below us. And, I don't know exactly how bit Antarctica is but I guess we can certainly see more than 50 percent of it. And - the rest of it is all ocean. The Indian Ocean out into the Pacific Ocean back into the Atlantic Ocean and for the most part relatively clear of clouds except in the Antarctica region, and up towards Europe which is - which is on the horizon, across the Mediterranean it looks like there might be some clouds back up in that way. I Probably - probably - well not probably I can make out the entire coast of Africa from Mediterranean around to the west on back to the south back where it takes it's big dip to the east, back around the cape, back around up through the Suez Canal; almost perfectly.

CAPCOM Roger, we understand.

SC And there's one batch of clouds that in northern Africa, just a small batch, it looks like it may be up near the - well no it's not near the mouth of the Nile it's quite a bit west of that, as a matter of fact, I can see the mouth of the Nile, I can see it running straight down towards us as it parallels the Suez and then sort of fades out into the central darker brown or darker green portions of Africa.

CAPCOM Roger, Gene. Sure would be nice to have that on TV wouldn't it?

SC Oh, I'd love to give it to you, any way I could.

SC You know, there's no strings holding it up either, it's out there all by itself.

CAPCOM Roger. I just was going through the 17 status report on the CSM systems and boy everything is absolutely nominal with the exception of as glitching master alarm that we're trying to still track down but every other system is just nominal, everything is great.

SC Okay, sounds good, that's the way they built it for us.

CAPCOM Gene, looking at our plot board, you're directly over the southern tip of Africa, or just slightly out in the Indian Ocean there according to our plot board which isn't exactly accurate at all times. But shortly you're gonna start going backwards on the Earth here and head back across the Atlantic, that ought to be some sort of a first; you cross the Atlantic twice, going from west to east, and now you're going to cross it going from east to west here shortly. All in a very short span of time.

SC Yeah, I guess that does sound like a first.

END OF TAPE

PAO This is Apollo Control at 5 hours 30 minutes ground elapsed time. The white team of flight controllers, headed by Gene Krantz, is in the process now, of handing over to the team headed by flight director Pete Frank. After 12 hours, the team came on about 3 hours prior to the scheduled launch time of 8:53 PM Central Standard Time. Of course, launch occurred 2 hours 40 minutes late at a ground elapsed time of 11, - of a Central Standard Time rather, 11:33 PM. As a result of the late launch-time the translunar injection, that's up through translunar injection, also slipped 2 hours, 40 minutes. We would expect that the translunar injection which is targeted to make up the difference will get us back on the nominal flight plan time by the time the spacecraft arrives at the Moon. In other words, arrival time at the Moon would be at the same Central Standard Time as called for in the Flight Plan at about 1:49 PM Central Standard Time, December 10. But, the Ground Elapsed Time would be about 2 hours, 40 minutes earlier than that provided for in the Flight Plan, the arrival being at about 86 hours, 14 minutes ground elapsed time. The 2 hour, 40 minute difference being accounted for in a speedier arrival time at the Moon, a translunar injection burn being targeted just slightly longer than would have been the case in a normal launch. The spacecraft getting to the Moon in a total elapsed time 2 hours 40 minutes less, in effect, making up for lost time from the late launch. In order to get the flight plan back in agreement with the ground elapsed time the GET, or ground elapsed clock, will simply be moved ahead 2 hours, 40 minutes between now and the time spacecraft arrives at the Moon. So, that by the time Apollo 17 is inserted into Lunar Orbit, the GET will once again agree with the flight plan GET and of course, the Central Standard Time of arrival will be the same as was originally planned by virtue of a speedier trip time. As a result of the late liftoff it was not possible to program television coverage of the transposition and docking. This was because of a shift in the orbital ground track moving the ground track away from the needed Manned Spaceflight network coverage for television. We simply didn't have an adequate ground station to receive the television signal from the spacecraft. There has been one recurring problem that is yet unexplained. That is in the displays and control system. The crew reported on several occasions that master alarm was occurring. The master alarm manifests itself in a form of a light that flashes in the Command Module. There are three of these lights and also a tone that comes on and a normal procedure is when the master alarm light comes on and the tone sounds, the crew then looks at another matrix of lights to determine precisely where the problem is. However, when looking at this matrix of lights none of them were lighted, indicating that some spurious signal had ignited or lighted the master alarm light and that there was in fact no problem in the systems. There is at this point no explanation for the problem. However, engineers here in

APOLLO 17 MISSION COMMENTARY, 12/7/72, CST 5:06, GET 5:30, MC-71/2

the Control Center, are looking into the past history of panel 2, which is the panel on which a number of switches are located, which have triggered this master alarm to see if there is a history of panel 2 that would indicate a possibility of some momentary short in the caution and warning system, which could give a master alarm. Apollo at this point is an annoyance, but does not appear to be a serious problem. All other spacecraft systems are performing normally, and the trajectory to the Moon is almost precisely as planned at this point. We do not anticipate a change of shift press briefing. The white team will be coming back on at the regular Central Standard Time 4:00 PM tomorrow. And in light of this rather short turn around we're going to forego the change of shift press briefing. At 5 hours, 36 minutes this is Apollo Control, Houston.

END OF TAPE

SC Bob, this is Jack here. We've got a UCTA dump scheduled, is possible at 6 o'clock. There's nothing secret about that time is there?

CAPCOM Nothing at all. When ever you are ready, just go ahead and dump.

SC Okay.

SC Bob, one of the things that we miss in our training is a good geography lesson and particularly on Anarticia. I got the binocular out and apparently the dark band that Gene - Ron mentioned and interfaced between the intercontinental water is that between the pack ice and the water and you can - by very subtle changes in the various movements of the ground probably make out where the actual continent begins and the pack ice ends. There are a few exposed ranges. I guess it's mid summer down there now and you can make out the snow free areas scattered at least in the northern portion of the continent.

CAPCOM Rog. Did you get any pictures of that, Jack?

SC Oh yes. We got some pictures earlier. I'm going to get another one here in a minute. I'll tell you, if there ever was a fragile appearing piece of blue in space, it's the Earth right now.

CAPCOM Roger.

SC There, we got a master alarm.

CAPCOM Okay, we copy that.

SC And there's one in the LEB.

CAPCOM Okay, good data point.

SC And there are no caution lights.

CAPCOM It came right at an accumulator cycle along with the high O2 flow again.

SC Yes, I just checked the time and I think you are right on that one. But we gave you your LEB data point.

CAPCOM Yes, sir.

SC The problem with looking at the Earth - particularly Anarticia, is that it is too bright.

CAPCOM I understand.

SC And so I'm using my sunglasses through the binoculars, which is not the best viewing platform. I think I can see some of the areas of the Dry Valley but again I'm not too sure of my geography, Bob. There are clouds over the continent, I believe. But, of course, they are just as white as the snow and you only see differences in texture brought out by - probably by varying photometric return because of fairly low sun angles down there.

CAPCOM Roger.

SC But you can see patterns of, what I believe is, pack ice leading off from that sharp interface that was talked about earlier. And those patterns seem to merge directly with the patterns of the clouds as if the - at least near the continent - the oceanic currents are controlling the air currents up to a point along with the movement of the pack ice.

CAPCOM Roger.

SC I'm distinguishing the pack ice from clouds mainly by the angularity of the patterns within them. There is no good clear color or albedo distinction. So, I could be looking entirely at clouds but I suspect there are some pack ice patterns too. I'm not keeping you awake, am I, Bob?

CAPCOM No sir. Just keep talking. We're listening. I'm sure not much of the world is listening but this will all be recorded and you can read it all when you get back. And think it through and tie it up with the pictures and I'm sure there's going to be people interested in this. And we're interested ourselves, so just keep talking.

SC All I want to do is read what I say.

CAPCOM Rog. If I had a little more geology training I'd be asking you some better questions. Right now, I can't think of any to ask you.

SC Well I can't - I really wish I knew geography. I don't know - I wish I'd thought of bringing a good map of Anartica. Could somebody do a little researching for me and see if they could tell me if we're to have a little American view - say on the eastern edge of the continent?

CAPCOM Rog. We'll see if we can get some Anartica geographers around.

SC Yes, I'd like to - and also whether or not they think the Dry Valley area - if this will do it. Could be - there's some people over there in Bill Petty's group I think have a little Anartic experience, or used to. They might be able to help you out.

CAPCOM Okay. We'll see what we can track down on it.

SC Don't use up a lot of people's time on it but -

CAPCOM Roger. It's getting pretty empty around here. It's 5 in the morning.

SC The sun gives a strong light reflection off of the buildup in the low level clouds, whereas the high level and normally layered appearance, and maybe some of the intermediate level stratus get to look gray, because of grazing sun I suspect.

CAPCOM Roger. You mentioned several things on this orbit that kind of intrigued me, you mentioned seeing the rainbow, and we were trying to figure out how you saw a rainbow up there, and you were in orbit already at that time. Do you remember that?

SC Well, we were speaking of the merits of the sunrise.

CAPCOM Okay that's -

SC That's having a banded color appearance that varied as you approached the sunrise. I can't remember what we - I think we put some of that on tape, we were probably LOS at the time, but the banded character of the sunrise in the atmosphere was very very marked. There was a gray-blue upper layer that merged or graded into a brilliant blue intermediate zone that was just above the cloud level and within the clouds, you got an orange to yellow band getting more yellow as the sun rose, that was broken by the dark patterns of the buildup.

CAPCOM Roger. Good show.

SC The interesting thing was the continual glow on the horizon, we had even at night. On the darkside pass, and that glow was in the atmosphere because I could see stars rise over the horizon in it and then pass on through it.

CAPCOM Roger. You were talking, the air glow low I guess is the phenomenon most interesting thing before us. Kind of interesting.

SC Yes, that's right, it's I guess standard air glow, but it is very striking and it's a continuous thing even in the dark pass.

CAPCOM Roger.

SC I think I did see the eastern tip of South America now.

CAPCOM Roger, you're starting to backup now, coming the other way, so you're still over Africa according to our chart here, but you're backing up towards South America.

SC Yes, I can see the part on South America that mercator thought that fit in with the bend in Africa some many decades ago and started people thinking about moving continents around on the crust.

CAPCOM Roger. Jack, how'd the PGA doffing go? Are you all out of the PGA's now?

SC That's been worked. We're taking it slow and easy up here, Bob.

APOLLO 17 MISSION COMMENTARY 12/7/72 CST 5:32 GET 5:56 73/2

CAPCOM Roger, understand.

SC I'll just be curious to see if they all
fit in that bag.

SC I think you'll find that Ronald Evans
will also be curious about that. He's already made comments.

CAPCOM Roger.

PAO This is Apollo Control at 6 hours. As
Jack Schmitt gives the description of the earth, Apollo 17
is 22 868 nautical miles from earth velocity 12 520 feet per
second.

SC We certainly do have a very clear
intuitive impression although the evidence is hard to put
together that the frontal drifts that move off the Antarctic
continent do not take on any well defined characters until
they get into the moist regions of the ocean, and when they
do they seem to pick up an -

END OF TAPE

SC - character until they get into the voice regions of the ocean and when they do, they seem to pick up an arcuate circulation that in the view we have seem to get fairly spaced cyclones patterns that lie between the Cape of Good Hope and northern portion of Anarctica and these certain circulations of cyclones follows roughly an east/west pattern and the curve - the arcs of the fronts are more north/south than let's say northwest swinging around to the south.

CAPCOM Roger.

SC All of them - all of them very nicely defined as southern hemisphere cyclones. There are about 4 of those visible swinging around oh I guess that's latitude I'm having to guess here but I'd say latitude 50 to 60 South.

CAPCOM Okay, 50 or 60 South then huh?

SC Yeah, I'd have to look at the map here in a minute see if that puts me between Anarctica and the Cape.

CAPCOM Roger.

CAPCOM Well, the tip of Africa there is about 32 South.

SC Well, that sounds like a pretty good guess. It look like the intertropical convergence zone over Africa is starting to get more and more clouds in it now. I suspect as midday approaches, which is what we're seeing there, we can expect to see more and more moisture indications.

CAPCOM Rog, they're probably about noontime right there right now, it's 11:36 at the zero meridian at Greenwich so it's just a little bit before noon right in that area you're talking about.

SC Yeah, some of those masses of what I suspect are cumulus build ups, well not really, they don't look they're as concentrated and localized. More like just masses of fairly dense clouds that are developing in that band of green, that crosses the lower portion of Africa.

CAPCOM Roger.

SC Stay tuned for the next installment on the Earth, I'll try and get out of this suit.

CAPCOM Okay, just take it easy Jack, and we'll be listening.

SC Man, I've never taken it so easy in my life, I'll tell you Bob, I couldn't believe this would be an experience like it is now.

CAPCOM Roger.

SC Everytime you turn around there is something else to see and wonder what's causing it. Whether it's a particle zipping across the window or one zipping across the cabin or springs mechanics here in zero-g; there's always something going on.

CAPCOM Roger.

PAO This is Apollo Control at 6 hours 7 minutes No midcourse correction number 1 will be performed. The value of the maneuver that would be required is less than 3 feet per second and midcourse correction number 1 will not be performed by Apollo 17. The spacecraft is now 23 682 nautical miles from

APOLLO 17 MISSION COMMENTARY 12/7/72 06:00 GET 05:36 CST 74/2

PAO Earth, velocity 12 301 feet per second.

SC Bob, if I'm not waking you up an observer from another planet certainly - probably could decide that we have such things as clouds at least large thunder storms because right at the terminator you get a brightening of the Sun lit side and a long, long shadow out to the out to the east that is reminiscent of what we saw in the early days looking at the Moon at the terminator.

END OF TAPE

SC That is reminiscent of what we saw in the early days looking at the Moon at the terminator.

CAPCOM Roger.

SC However, in the next pass around, I'll bet you wouldn't see them.

SC I've never been a big - well, I didn't grow up with the idea of drifting continents and sea floor spreadings, but I tell you, when you look at the way the pieces of the northeastern portion of the African continent seem to fit together separated by a narrow gulf, you could almost make a believer of anybody.

CAPCOM Roger, it's beginning to look like the globe that you might buy down at the store, huh?

SC Oh, I don't think so Bob.

CAPCOM Okay.

SC I don't think we'd better put this one up for sale. Somewhere there might be somebody that would like to buy it.

CAPCOM Say, Jack. We noticed the O2 flow has dropped down now. We're wondering, did you all close the waste storage vent valve.

SC I don't think so, let me check on that. It might have gotten closed inadvertently in the game we were playing down in the LAB.

SC Ron says it's still on vent.

CAPCOM It's on vent, Roger.

CAPCOM Okay, we're noticing that the flow is coming back up slowly so something caused it to drop, and it's coming back up.

SC Okay.

CAPCOM 17, Houston.

SC Go ahead.

CAPCOM Jack, just to ease those words I said before, we looked at the schematics here a second and you've been dumping urine out of that same line as that waste vent, and that would probably cause the pressure to build up enough to slow the O2 flow, and we notice that the O2 flow is climbing back up to where it belongs.

SC Well, that's clever. Okay.

CAPCOM Didn't mean to worry you there, shouldn't have said it, I guess before we looked at the schematics.

SC Oh, I really hadn't started to worry about it yet, Bob, so no sweat.

END OF TAPE

APOLLO 17 MISSION COMMENTARY, 12/7/72, CST 5:06, GET 5:30, MC-75A/1

SC Bob, I can assume that from what you said there will probably not be a midcourse 1.

CAPCOM That's exactly what we're working towards, Gene. And I'm sorry I didn't convey that feeling to you a little earlier. There's no reason for midcourse 1 right now.

SC Okay, because we prefer to press on and get the suits off and hit the sack, rather than making them, unless we have to.

CAPCOM That's for sure. Roger. The earlier data showed us midcourse 1 would have been less on 3 feet per second and we wouldn't have done it. And the data's been fluctuating. And they're smoothing it out and it's still holding that way, so we won't be doing it probably.

SC Okay. Very good.

SC Bob, I'm looking over Gene's shoulder here at the Earth and it must be an awful clear day for the so called convergence zone across Africa. Gene I think indicated that when we crossed it earlier, most of Africa is clear. Only some, probably broken, scattered clouds cumulus in the east central portion that are running on the lines of north south lines.

CAPCOM Roger.

SC Looks like a major circulation system off the southern tip of Africa as Gene mentioned, plus one west of that, 20 or 30 degrees of longitude. Make that east of that.

CAPCOM Roger.

SC And, southwest of - make that south, southwest of the tip of Africa at Cape Good Hope, there looks like an insipient circulation system developing about half way between the Coast of Anartica and Africa. If I had to guess, it's going to swing up north toward the Cape and then swing west. The whole pattern, looks like now a fairly equally spaced cyclones that are sort of circling around the Anartic continent and we can see it now.

CAPCOM Roger, Jack.

SC I would guess that South Africa is going to have good weather for several more days at least. And if the pattern is apparent the clouds we see are correct the last disturbance I mentioned probably is going to pass down to the Cape also.

CAPCOM Roger. Understand.

SC As we were going over our daylight around the earth in our orbit, it was very clear looking at the various clouds, Bob, what were high clouds and what were low clouds, particularly when you have them together. High clouds carry very distinct shadow patterns on the lower ones and very commonly had entirely different orientations, pattern orientations. The low ones seem to be more associated with (garble) front patterns, whereas, the high clouds were generally transverse to that roughly north south directions. That's not completely general observation, but I noticed it several times.

CAPCOM Roger, understand.

APOLLO 17 MISSION COMMENTARY, 12/7/72, CST 5:06, GET 5:30, MC-75A/2

CAPCOM I just noticed on the blackboard here, it
looks like you've come up on 20 000 miles out right about now.
SC It feels like about 20 000, Bob.
CAP Okay.

END OF TAPE

SC How'd the S-IVB work go, Bob?
CAPCOM It just finished the second burn and it's targeted right where they want it. Just working perfectly.
SC Where were they going to put that one, I guess I lost track of that?
CAPCOM Seven degrees south and 8 degrees west, Jack.
SC Say again, you cut out of the first.
CAPCOM Okay, 7 degrees south and 8 degrees west.
SC Okay.
SC That ought to be interesting.
PAO This is Apollo Control at 6 hours 24 minutes. The S-IVB maneuver that was just being discussed was performed with the auxiliary propulsion system; just completed Delta V of 13 feet per second to tune up the trajectory for S-IVB impact at the desired location on the lunar surface of 7 degrees south, 8 degrees west. That's approximately 200 kilometers of the Apollo 14 ALSEP site where the seismometer is located. That impact is expected to be picked up by the other seismometers on the Moon, the other Apollo lunar surface experiment seismometers. Booster systems engineer is now maneuvering the S-IVB stage, the third stage of the launch vehicle to a solar heat control attitude. This is to minimize the heat into the instrument unit. They will then track the stage for a considerable length of time and determine whether another corrective burn will be required. At 6 hours 25 minutes into the mission, this is Mission Control, Houston.
PAO This is Apollo Control at 6 hours 27 minutes. Booster systems engineer has just reported to the Flight Director that the S-IVB stage is in good shape, with 14 hours life time remaining. The limiting factor on the S-IVB is the battery life. Fourteen hours of battery life remaining on the S-IVB.
SC Hello, Houston, how do you read CDR?
CAPCOM Read you loud and clear, Gene.
SC Okay.
SC Bob, LMP's going off the air for a little while.
CAPCOM Roger, Jack.
SC It sounded like a kind of a sigh of relief.
CAPCOM No sir. Been enjoying listening to you, keep me awake down here.
SC You had a long day.
CAPCOM Not as long as you've had.
SC I've been lying around, floating around.
CAPCOM You make it sound so good.
SC Piece of cake. I'll talk to you in a little while.
CAPCOM Yes sir.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/7/72, CST 6:06, GET 6:30, MC-77/1

PAO This is Apollo Control at 6 hours 34 minutes.
Apollo 17, now 26 553 nautical miles from Earth. Velocity 11 606
feet per second.

SC Houston, Apollo 17.

CAPCOM Go ahead, Ron.

SC Okay, we had another master alarm and I just
glanced up and it was the main A undervolt light that was on just
for a second.

CAPCOM Okay - -

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/7/72 06:16 CST 6:40 GET MC78/1

SC Just for a second.

CAPCOM Okay, Ron, we didn't see anything at all on main A down here. We did have accumulator cycle again? Don't know if that ties it or not.

SC Well, the main A interval - I just happened to be looking at the panel and the main A interval light flicked on for a second. And of course, obviously, main A is up now.

CAPCOM Roger.

CAPCOM Ron, Houston, here. We've checked the back room and the high speed charts and that and don't see any glitch on main A at all on our data down here.

SC Okay, Bob.

PAO This is Apollo Control. It's 6 hours 49 minutes. Apollo 17 is 28 232 nautical miles from Earth; velocity 11 291 feet per second. We're continuing to operate at present on the normal GET of the flight plan, normal ground elapsed time. Under that schedule the crews rest period will begin about 9 hours and 15 minutes into the mission. If, however, the crew completes the activities that are scheduled in the flight plan early the rest period will probably begin early if they so desire. However, at the present time we are continuing to operate on the GET of the flight plan. At 6 hours 50 minutes, this is Mission Control, Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY, 12/7/72, CST 6:25, GET 6:50, MC-79/1

PAO On the GET of the Flight Plan. At 6 hours
50 minutes, this is Mission Control, Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY, 12/7/72, CST 6:35, GET 7:00, MC-80/1

PAO This is Apollo Control at 7 hours 7 minutes.
Apollo 17 has just passed the 30 000 mile mark on its journey to
the Moon. Now, at 30 039 nautical miles, velocity continuing to
decrease now 10 932 feet per second.

SC Houston, 17. That was 02 flow high.

CAPCOM Roger. We copy that one. We saw it, just
about ready to call you when you called us just now.

SC Okay. Very good.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/7/72 06:44 CST 7:10 GET MC81/1

SC Just about ready to call you when you
called us just now.

CAPCOM Okay, standby.

PAO This is Apollo Control at 7 hours
15 minutes. Astronaut Bob Parker is now relieving Astronaut
Bob Overmyer at the CAPCOM console and the commander of the
backup crew, Captain John Young, has just left the control
room. He has been sitting at the CAPCOM console with
Overmyer since returning from the Cape early this morning.
So the next CAPCOM voice you will hear will be that of Bob
Parker.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/7/72 CST 6:45 GET 7:20 82/1

PAO This is Apollo Control at 7 hours
34 minutes. Apollo 17 now 32 697 nautical miles from earth
velocity 10 457 feet per second. The crew a little over
midway in the scheduled meal period in the flight plan.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/7/72 CST 7:14 GET 7:40 83/1

SC Houston, 17.
CAPCOM Roger, go 17.
SC That little master alarm there, I can't be absolutely positive, but out of the corner of my eye I think it was the suit compressor light that glitched.
CAPCOM Okay, we copy that. We believe down here that it was the high O2 flow.
SC Well, they're pretty close, I thought it was red and I thought - okay that's good. That's the right time I guess.
CAPCOM Okay, cause we'd just called it out just 5 seconds before you called.
SC Very good Doctor.
CAPCOM Roger, and Tony is back in Houston on the console.
SC That's hard to believe, what are you doing back there. We haven't even had time to go to sleep?
CAPCOM Well, I tell you, it's a tale that's hard to believe, it's almost as miraculous as your escape from the pad tonight.
SC Did you enjoy the launch?
CAPCOM Beautiful.
SC You've seen 1 night launch you've seen them all, huh Parker?
SC (garble) to SCS. Okay.
SC Never know if it's drifting up or (garble)
SC Dust all over the place.
SC The stars are.
SC Do a little better now.
SC Bob, Mag November November is 130 now, and I just took another set of earth pictures.
CAPCOM Okay, copy that. November November and 130.
SC Houston 17, have you got the torqing angles yet.
CAPCOM Roger. Okay, we have them and you're GO to torque them.
SC Okay, I'm going to torque at 58 10.
PAO This is Apollo Control at 7 hours 58 minutes. Ron Evans is realigning the inertial platform that was scheduled on the flight plan for 8 hours 15 minutes. That indicates that they are running 15 to 20 minutes ahead of the flight plan. Jack Schmitt is obviously taking some pictures. He gave Bob Parker a report on a film magazine that he was using.
SC (garble)
CAPCOM And 17, we have a preferred REFSMMAT standing by if you want to give us ACCEPT and we'll send it up before you do your second P 52.

APOLLO 17 MISSION COMMENTARY 12/7/72 CST 7:14 GET 7:40 83/2

SC Okay, you have POO and ACCEPT now.

CAPCOM Roger, on the up data, it's coming in now. And Ron, while we're sending it up to you, we'll also send you an update on the 0 trunnion bias as per the flight plan.

SC Okay, mighty fine.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/7/72 7:33 CST 8:00 GET MC84/1

SC Ah, just for the flight plan.
CAPCOM Okay, mighty fine.
SC Somewhere. There it goes.
SC There they are. Right there.
CAPCOM Okay 17. Ron, you can go to block now.
You can PTC REFSMMAT. You're free to do P52 option lif you
want. And be advised we are suspicious from time to time you
may have an open mike there.
SC Okay. Thank you, Bob.

END OF TAPE

APOLLO 17 MISSION COMMENTERY 12/7/72 08:10 GET 07:43 CST 85/1

SC Okay, Houston those are the differences in the gyro target valve, target at oh eleven I guess.
(garbled)

CAPCOM Roger, copy that.

PAO This is Apollo Control at 8 hours 12 minutes.
Apollo 17 now 36 353 nautical miles from Earth, velocity 9 878 feet per second.

CAPCOM Apollo 17, Houston, over.

SC Go ahead.

CAPCOM Rog. We've been discussing the question of what your frequency is going to be in terms of headset or not with reference to all of these various master alarms, and I guess we'd feel better if one of you guys slept with his headset on. We were curious as to what your plans are.

SC Bob, since I've got to wear the bio net anyway, I might just as well go ahead and keep it on.

CAPCOM Okay, the other option is for us, if we're trying to get hold of you is to put the klaxon on but we're a little un in favor of that because of the possibility one of these spurious things waking everybody up that way.

SC Yeah, I'll go ahead and keep it on and see how that works out, for a while.

CAPCOM Okay, we copy that. And, when you guys are ready we have a couple of - we have 3 items to read up to you for the updates of the flight plan.

SC Okay, go ahead Bob.

CAPCOM Okay, the first's in the flight plan itself and it's the quads for the spin up and they'll be alpha and Bravo.

SC Okay for PGC spin up quads and Alpha and Bravo.

CAPCOM All right, we just took that back. It should be Bravo and Delta for spin up Alpha and Bravo only for damping. Copy Bravo and Delta for spin up Alpha and Bravo for damping.

END OF TAPE

APOLLO 17 MISSION COMMENTARY, 12/7/72, CST 7:50, GET 8:17, MC-86/1

SPEAKER As soon as you have that I have two others one in Flight Plan Supplement Book, and the other one is in the GNC Checklist.

SC Okay. Go with the supplement.

CAPCOM Okay. On the Flight Plan Supplement we have an E-load update. On page 1-43, say 1-43, give me a call when you get to that page.

SC Okay, Bob. I'm there.

CAPCOM Okay. Under line it's 30704, column Bravo, you fine currently 33550. And let me give you a word of warning. When we change this, we'll be changing this again around 67 hours. These are primarily due to the launch delay. And we'll give you another GET update of this sort later on. The new number to replace - -

SC Bob,

CAPCOM Go ahead.

SC Let me get a pencil please - -

CAPCOM Okay.

SC I just have a pen.

CAPCOM Okay.

SC Go ahead.

CAPCOM Okay. Under - - Again I remind you 30704 column BRAVO was 33550 is now 34761. The line just below it which is 05 also in column BRAVO is 15403. Over.

SC Okay, Bob. For 30704 BRAVO 34761, and for 31005 BRAVO 15403.

CAPCOM Okay. Very good. The next one is in the GNC Checklist under the T-37 block data. To help you find it, that's on page 4-23.

SC Okay. Go ahead.

CAPCOM Okay. On the liftoff plus 15, your first block is 01500, 3893, minus 174, 05756. The second block from liftoff 125 is 05 - pardon me, start over again there. 02500, 6651, minus 175, 05725, over.

SC Okay, Houston, Apollo 17. First one would be 01500, Delta V will be 3893, minus 174, and GET 400 K is 05756. The other one is Tig of 02500, Delta-V is 6651 longitude, minus 175, GET of 400 K is 05725.

CAPCOM Roger. Good readback.

SC Okay Bob. This is Jack. I'm going to be moving into the presleep checklist here. Are there any things you want to change or alter in that? Are you ready for the waste storage vent to be closed?

CAPCOM Roger 17, we're ready for the vent valve to closed, waste storage vent to close. And we have no anticipated changes at the present time in the flight plan, Jack.

SC Okay, I was just looking at 1-29 in the pre-sleep checklist, and wondering if there was anything there.

CAPCOM Standby Jack.

APOLLO 17 MISSION COMMENTARY, 12/7/72, CST 7:50, GET 8:17, MC-86/2

CAPCOM Okay, 17. For antenna management tonight, we'd like you to select OMNI BRAVO at the current time and stow the high-gain antenna and we'll take care of managing antennas from here on.

SC Okay. We'll give you OMNI BRAVO and stow the high-gain.

CAPCOM Okay.

CAPCOM And Jack, we indeed do not have anything to add to the presleep checklist tonight.

SC Okay.

SC And with your concurrence I'll take the H2 band to auto now.

CAPCOM Roger we're ready for that all to auto.

CAPCOM Okay, - -

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/7/72 8:00 CST 8:27 GET MC87/1

CAPCOM Jack, I guess that - we're not sure what you said or meant there or what. In the flight plan, itself, we want H2 heaters and 1 and 2 to AUTO and we want H2 fans on tank 3 only, AUTO. There - 3 there for H2 tank 3.

SC Okay, you're teaching me to read carefully early, aren't you?

CAPCOM We're trying. The 1 and 2 heaters will be on AUTO and 3 fan will be on AUTO.

SC That's the way it is now and consider the fans have been cycled.

CAPCOM Roger.

SC According to the checklist.

SC You might look at the third line on 1-29 and look at the H2 line on the flight plan and see why I was confused.

CAPCOM Roger. We were just discussing whether or not there was a fan or fans in each tank.

SC That ought to keep you awake this morning.

CAPCOM Did I say something?

SC What I was really trying to do, Bob, was getting out of chlorinating the portable water but you wouldn't bite.

PAO This is Apollo Control at 8 hours 28 minutes. Apollo 17 now 37 thousand 8 hundred 32 nautical miles from Earth; velocity 9 thousand 6 hundred 67 feet per second. Apollo 17 crew in the period now in the flight plan where they're making preparations for their rest period. Getting the systems in the proper configuration for a sleep period. The spacecraft has been maneuvered to the passive thermal control or PTC mode - attitude, rather. And just prior to the rest period the crew will spin up the spacecraft for thermal control during the rest period. The spin rate will be slow or approximately 3 revolutions of the spacecraft per hour but it will keep the thermal balance on the spacecraft. At 8 hours 30 minutes, this is Mission Control, Houston.

CAPCOM Apollo 17, Houston. Over, Jack.

SC Go ahead. Over, Bob.

CAPCOM Okay. We're going to give you a little high-gain antenna practice here. We'd like to pick up with the high-gain antenna again so that we can get your PTC - watch your PTC develop. We'd like you to go to a pitch of 40 and yaw of 275 on the high-gain. That's 40 pitch; 275 yaw; and manual on wide. Over.

SC 81 on the high gain selected, I presume.

APOLLO 17 MISSION COMMENTARY 12/7/72 08:00 CST 8:27 GET MC87/2

SC Now that helps, too.
SC You got it.
SC Roger. Our apology.
SC Oh, I don't expect that will be the last
time you have to apologize. I think we're running about
even, now.
SC You're missing quite a view, Bob. Sorry
you're not here.
CAPCOM That makes two of us.
CAPCOM Dwight just said, "That makes three of
us".
SC What are you trying to tell me?
CAPCOM Look out.
SC Who's your friend off on your right
tonight?
CAPCOM Wally Moon, would you believe?
SC Say it again.
CAPCOM Wally Moon.
SC Oh, a Moon, huh?
SC Why don't you ask him what he's reading
at H2 tank 3 quantity?
CAPCOM Okay. I'm asking him
SC In percent.
CAPCOM Okay, 17. Now in tank 3 of H2 we're
reading 84:38.
SC Okay, it looks like we're reading almost
the same now days.
CAPCOM Good.
SC I know we launched a little bias but I
guess that's gone now. We're a little higher than that.
CAPCOM And 17, Houston. We're seeing your
rates are quite low enough to start spinning up to PTC.
SC Okay, we'll see if we can't get it right
this time.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/7/72 08:10 CST 08:37 GET 88/1

SC Houston, 17.
CAPCOM Go ahead, 17.
SC Does it make any difference with the plus or
minus roll there now that you are going to use the high gain?
CAPCOM Okay, the Flight Plan says minus roll, why
don't we do it that way.
SC Okay.
CAPCOM After you start the roll 17, we'd like to
go back to omni bravo and stow the high gain.
SC Okay
CAPCOM We only need the high gain to keep a good
check on your rates.
CAPCOM And 17, that means stow the high gain after
you - after the start up, we'd like to watch the start up itself.
SC Okay, I was just going to ask you when.
CAPCOM Okay, 17 we're ready for high gain to stow
and select omni bravo.
SC Okay.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/7/72 CST 8:20 GET 8:47 89/1

CAPCOM 17, Houston. We gather you're ready for sleep, almost. One thing we'd like to check at the end here is your 02 heater configuration. Over.

SC Okay, go ahead, Bob.

CAPCOM Roger. Could you give us your 02 heater configuration?

SC Okay, we've got 1 and 2 in AUTO and 3 is OFF.

CAPCOM Okay, we'd like those per the flight plan, 1 and 2 to OFF and 3 to AUTO.

SC Okay, 1 and 2 to OFF and 3 to AUTO.

CAPCOM Okay, and do you have a final change or update on the film status beyond that 130 that Jack gave us?

SC Stand by one.

PAO This is Apollo Control at 8 hours 55 minutes. As the crew of Apollo 17 prepares for a 5-3/4 hours rest period, the spacecraft is 41 165 nautical miles from earth velocity 9 349 feet per second.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/7/72 08:30 CST 8:57 GET MC90/1

CAPCOM And, 17, your PTC is looking real good so far.
SC Okay, and the number and that mag is still 130,
Bob.

CAPCOM Okay, I copy that, Gene.
SC And Alpha, Alpha, that 16 millimeter mag is
about 25 percent left.

CAPCOM I copy that as well.

CAPCOM And I guess as soon as you change the LiOH
canister if you have or haven't, and charge battery Bravo, then
we're ready for you to sleep at your leisure. In figuring your
comm, remember the squelch enable and the voice OFF when you get
ready to go to sleep.

CAPCOM Roger, Apollo 17, we copy the film update and
we're ready for you to go to sleep once you got the LiOH canister
changed if you haven't, and remember also the charge on battery
Bravo. After that it's just the comm configuration, squelch enable
and voice OFF, when you get ready to go to sleep.

SC Roger. You cut in and out. Standby. We'll
talk to you in a minute.

CAPCOM Okay, I think we'll (garble) anomaly.

END OF TAPE

APOLLO 17 MISSION COMMENTARY, 12/7/72, CST 8:40, GET 9:07, MC-91/1

PAO This is Apollo Control with 9 hours, 12 minutes.
Apollo 17 now, 41 677 nautical miles from Earth, velocity 9159 feet
per second. The spacecraft has stabilized into a passive thermal-
control mode now. It is completing one revolution every 18 minutes.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/7/72 CST 8:50 GET 9:17 92/1

PAO This is Apollo Control at 9 hours 26 minutes. The Booster Systems Engineer has advised Flight Director Pete Frank that a second midcourse correction for the S-IVB, the third stage of the launch vehicle will be required. This maneuver is performed with the auxiliary propulsion system of the S-IVB, and the Booster Systems Engineer will command this burn at 11 hours 15 minutes ground elapsed time. The magnitude of the burn is not known at this time. That will be determined shortly before the midcourse is performed. The purpose is to tune up the trajectory to more precisely target the S-IVB stage to the desired impact point on the lunar surface. Tracking to this point of the spacecraft indicates that a midcourse correction will probably be performed for the spacecraft at the scheduled midcourse number 2 time at 35 hours and 30 minutes. A preliminary look - that's a very early look shows it to be about 10-1/2 feet per second, but that will be refined as we get closer to the time. At 9 hours 27 minutes, this is Mission Control Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY, 12/7/72, CST 9:01, GET 9:28, MC-93/1

PAO This is Apollo Control at 9 hours 30 minutes
We have had no voice communications with the crew for some time
now. But we do have indications that they have not yet fully
configured the spacecraft for their rest period. Normally the
voice switch is turned off the last step before the rest period.
That voice switch is still on. Apollo 17 now 43 261 nautical miles
away from Earth, velocity 8964 feet per second.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/7/72 09:10 CST 9:37 GET MC94/1

PAO This is Apollo Control at 9 hours 48 minutes. From the data that he is receiving, the Flight Surgeon, Dr. Sam Pool, reports that he believes the spacecraft Commander Gene Cernan is asleep. Cernan is the only member of the crew who is wearing the biomedical harness during the rest period, and therefore, is the only one that the flight surgeon is getting measurements on. But the indications are that Cernan is asleep and apparently the entire crew has gone to sleep. Apollo 17 now 44 749 nautical miles from Earth. Velocity 8794 feet per second. The awake clock as operating in the Control Center shows wake up for the crew in 5 hours 10 minutes 37 seconds.

PAO This is Apollo Control at 9 hours 59 minutes. The Flight Dynamics Officer, Bill Boone, has computed the half way marks for the spacecraft in both time and distance. We'll give those to you now. Apollo 17 will reach the half way point in distance at a ground elapsed time of 30 hours 3 minutes. Its distance from both the Moon and the Earth at that time will be 114 787 nautical miles. Its velocity, referenced to the Earth, will be 4522 feet per second; referenced to the Moon, 3826 feet per second. The half way mark in time will be reached at a ground elapsed time of 43 hours 8 minutes 6 seconds. At that time Apollo 17 will be 144 924 miles from the Earth, with an Earth reference to velocity of 3551 feet per second. And it will be 87 561 nautical miles from the Moon, with a Moon referenced velocity of 3403 feet per second. Apollo 17 will cross the lunar sphere of influence at the ground elapsed time of 70 hours 43 minutes 24 seconds, at which time it will be 190 725 nautical miles from the Moon. Earth referenced velocity 2340 feet per second. Distance from the Moon at that time, 33 639 nautical miles, with the lunar referenced velocity of 3356 feet per second. At 10 hours 1 minute into the mission, this is Mission Control, Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY, 12/7/72, CST 9:35, GET 10:02, MC-95/1

PAO This is Apollo Control at 10 hours 29 minutes. Apollo 17 now, 48 070 nautical miles from Earth, velocity 8434 feet per second.

Pete Frank and the orange team of flight controllers getting ready to hand over to Jerry Griffin and his gold team of flight controllers at this time. Astronaut Bob Parker will remain as the CAPCOM for a good deal of this next shift. Several spurious master alarms that were seen while the spacecraft was still in Earth orbit are as yet unexplained. There are no obvious reasons for them. The spacecraft experts in the back rooms, the support rooms here at the Mission Control Center are still tracking this situation. It's not considered a serious problem. The more recent master alarms that have occurred during this shift and during the translunar coast phase after Apollo 17 burned translunar insertion, are attributed to a higher than normal oxygen flow at regular intervals in the cabin. The cabin is still being purged of the partial nitrogen atmosphere that it contained at launch that is being purged, a vent valve is open in the cabin and the higher than normal O₂-rate has been introduced to help purge the cabin. Now, added to that when the water accumulator in the suit circuit cycles, there is a brief increase of oxygen flow over and above the higher than normal flow that we are using to purge the cabin. And this is just high enough to when the water accumulators cycles it brings it up just high enough to trigger the master alarm. It is not a problem. The last three or four master alarms that we have seen are attributed to this. However, the Earth orbit master alarms are not yet accounted for. But, they are not considered to be a serious problem. During this shift a midcourse correction number 1 was performed on the SIV-B stage of the launch vehicle, 13 feet per second performed with the auxiliary propulsion system. A second midcourse for that third stage of launch vehicle is planned at a ground elapsed time of 11 hours 15 minutes. The magnitude of the burn is not yet known. These midcourses are to tune up the trajectory of that stage, to bring it closer to the desired impact point on the lunar surface. As far as the spacecraft is concerned midcourse correction number 1 was passed. We did not perform midcourse correction number 1. The magnitude at that time was less than 3 feet per second. We will probably perform a midcourse correction number 2 at 35 hours and 30 minutes. A preliminary look at that indicates about a 10-1/2 foot per second burn at that time. The Mission is going well. We have not heard from the crew for some time now and are confident that they are asleep. The spacecraft is in passive thermal-control mode, stabilized in 1 revolution every 18 minutes, approximately 3 per hour. The crew is scheduled to be awakened 4 hours, 24 minutes from this time. At 10 hours 35 minutes into the Mission, this is Mission Control, Houston.

END OF TAPE

PAO This is Apollo Control at 11 hours 27 minutes ground elapsed time into the mission of Apollo 17. Approximately 11 minutes ago, as you were 6 minutes ago, the S-IVB corrective burn was performed roughly 14.2 feet per second to modify the trajectory of the S-IVB third stage in the Saturn V, targeting for impact just west of the crater Ptolemaeus at latitude 7 degrees south by longitude 8 degrees west. However, the actual impact location and the time of impact will be forthcoming after some additional hours of tracking of the stage has been gathered. We're looking now at a midcourse correction burn number 2 of the Apollo 17 spacecraft at 35 hours 30 minutes, with a change in velocity - a posigrade of 10.5 feet per second. Some 3-1/2 hours remaining in the crew rest period. All three apparently sound asleep at this time. And the passive thermal control mode puts the spacecraft at spinning at some 3 revolutions per hour. To repeat earlier statistics on half way in distance, time, and when the so-called sphere of influence is crossed will be at the half way point in distance at 30 hours and 3 minutes ground elapsed time, in which time it will be 114 787 nautical miles either direction to the Earth or Moon. And a half way point in time will occur at 43 hours 8 minutes and 6 seconds when the spacecraft will be 144 924 nautical miles out from Earth; and 87 561 nautical miles out from the Moon. The so-called sphere crossing, or the point in which the spacecraft is assumed to come under the gravitational influence of the Moon, will take place at 70 hours 43 minutes 24 seconds when the spacecraft is 33 639 nautical miles out from the Moon and approaching. The air/ground circuit has been up all of this time since the crew has retired for a fairly brief rest period, and at this time we will take down the air/ground circuit until the wakeup call is made some 3 hours 29 minutes from now. And at 11 hours 30 minutes ground elapsed time, this is Apollo Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY, 12/7/72, CST 13:00, GET 13:27, MC-98/1

PAO This is Apollo Control 13 hours, 27 minutes ground elapsed time into the Mission of Apollo 17. The spacecraft presently is 61 186 nautical miles out from the Earth, decelerating slightly in its velocity now 7272 feet per second. Crew had another hour and a half of sleep period remaining. They will be awakened about 2:30 Central Time. This is a rather short sleep period slightly under six hours, the object being to get the crew back on to Houston time day-night cycle eventually. The cycle disturbed somewhat by the, - initially what would have been a night launch, and ended up being a morning launch, - early morning launch at least by Cape time. Got a hand over to the Goldstone 210-foot tracking antenna, about 8 minutes ago. And, that station at the present time is handling spacecraft data, and when the crew awakens will handle the voice transmissions between the Control Center and the Crew of Apollo 17. At 13 hours, 28 minutes ground elapsed time this is Apollo Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/7/72 14:00 CST 14:27 GET MC99/1

PAO This is Apollo Control at 14 hours
27 minutes ground elapsed time into the mission of Apollo 17.
Slightly more than a half hour remaining until spacecraft
communicator, Robert Parker, wakes the crew of Apollo 17
up after a brief 6 hour rest period. Apollo 17 presently
65 thousand 2 hundred 73 nautical miles out from earth;
velocity now 6 thousand 9 hundred 74 feet per second. And
getting back on schedule with Apollo 17 because of the late
liftoff and the hold situation early this morning. The
translunar injection burn was targeted to get the spacecraft
at the moon or into lunar orbit at about the same actual
time it would have had we launched on time - at 8:53 P.M.
last night central time. However, to get the flight plan
back on the actual indicated ground elapsed times shown in
the flight plan at approximately 64 hours they're going to
have what is called a GET update some two hours and
40 minutes to force the event times in the flight plan to
agree with actual ground elapsed times flown in the mission.
We'll come up again in about a half hour as Parker makes
his initial wake up call to the crew and at 14 hours
29 minutes, this is Apollo Control.

END OF TAPE

SC From the looks of things, Bob, down there, it looks like getting off last night was a good idea.

CAPCOM Got a new Capcom now, Geno. Why does it look kind of cloudy down there?

SC Yes, hello Gordo, how you doing? Yes, I'm looking - oh we're probably directly over - just west of the Pacific, but the bottom third of South America I suppose, and I've got North America, Mexico and the U.S. on the top third - top 25 percent of the earth, and it looks like you've got cloud cover from somewhere where the coast bends around Corpus and north into the great lakes and completely out into the Atlantic and it could cover Florida (garbled).

CAPCOM Roger. I can verify the part between the Cape and Houston anyway.

SC Yes, the Gulf looks like it's pretty well filled with clouds, it looks pretty thick from here.

CAPCOM Roger.

SC However, if you're interested in going to South America, the whole continent looks pretty good, a few clouds, but for the most part you can see the entire continent.

CAPCOM Roger. It's summertime down there.

SC Hey Gordo, we're stirring slowly. We'll get back with you here.

CAPCOM Okay.

SC Gordo, 1 question. How does the spacecraft look to you? I didn't hear anything all night long as far as any master alarms or anything.

CAPCOM I'm getting the word that nothing was seen here either. It looks absolutely super.

SC Very good.

SC Hey Bob, or Gordo, I've got H2 heaters 1 and 2 OFF now.

CAPCOM Roger, Gene.

END OF TAPE

SC Hello, Houston, America.

CAPCOM Go ahead, America.

SC Okay, Gordo, I'm looking over the Flight Plan today. We'll be with you with the postsleep check list, and primarily it looks like a P23 day for Ron. And what we'd primarily like to do is spend a good part of that time getting the spacecraft cleaned up, reshuffled, restowed a little bit and get it in order for the next few days ahead. It doesn't look like today's that big of a day.

CAPCOM Okay.

CAPCOM Gene, I might give you some words on what we have in mind to get the GET back in sync here, if you want to hear those while you're looking through the upcoming hours.

SC Yes, why don't you pass a few words on that.

CAPCOM Okay, the plan we're considering, and we're offering it to you now for your opinion, is at 65 hours GET we'll update and at the time the clock goes to 65, we'll update it 2 hours and 40 minutes up to 67:40. And we're shaping your trajectory such that you'll arrive at the Moon at the same time GMT as you would have had you launched on time. In other words, your trans-lunar time is 2 hours and 40 minutes less. So once we do that, we'll be back with all the right times in the Flight Plan without any updating. And the one thing we think of is that your next day will, which is now a 16 hour day, will shorten to a 13 hour and 20 minute day. But that's about the only real affect we can see. How does that sound?

SC Yes, we - we'll get to the Moon you say the same GMT, so all our sunrise/sunset lunar orbit activity and sun angle at landing will be the same. And let me -- it sounds pretty good, Gor; I just want to take a look at that day that you're shortening and see what we're doing in there.

CAPCOM Okay. It doesn't cut out anything. In fact, we picked a time that's pretty much dead time as far as the flight plan goes. Take a look, and we'll talk about it later.

SC Okay.

SC Good morning, Gordie, this is Jack.

CAPCOM Good morning, Jack.

SC Let me fill my square on that post-leak check list. I've got 24030, PRD?

CAPCOM Okay.

SC And, I slept in and out--probably totaled about 4 hours in that last period. But, I feel pretty good in spite of that and expect now that I've educated myself on how to sleep that it'll pick up the next time around.

CAPCOM Roger.

SC No medication yet, but I'm considering a couple of aspirin. I'll let you know if I take them.

CAPCOM Roger.

SC And fluid -- let's see, I guess I've had two of your little water-measurement containers full so far, plus the meal I had in my pocket. And, I'll catch up on my -- I think I'm a little dehydrated, I'll catch up on fluids with breakfast.

CAPCOM Okay.

SC And my meal yesterday was the meal B in the pocket.

CAPCOM Roger. Meal B.

SC And I guess consumables up to eight, that's mainly yours, there's plenty there, and I'll wait for your words on that, and the watch is wound.

CAPCOM Roger.

CAPCOM Okay, got the consumables up to eight numbers if you're ready to copy.

SC Not quite, Gordie, I'll give you a buzz.

CAPCOM Okay. No hurry.

SC Okay, the CMP's rads 1509.

CAPCOM Okay.

SC 15019. 15019.

CAPCOM Roger.

SC Gordie, this is Jack. How do you want to send the consumables information?

CAPCOM We were just discussing that here in Houston. In flights gone by, there was a place in the flight plan, a little form to fill out, but we're trying to figure out if there is such a place in the current data file. Do you know of one?

SC No, I'll tell you what I've got on the consumables curves, and if there are any major changes to those curves, I guess you could give them to me, and I'll put them on as points.

CAPCOM There's no place at all.

SC Okay, and why don't we just do it that way in the future in case there is anything, and that's on page 145 and subsequent in the flight plan supplement.

CAPCOM Okay.

SC It looks like you took good care of my space - my systems last night.

CAPCOM No troubles at all.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/7/72 15:26 GET 14:59 CST MC103/1

SC Okay, Gordy, your friendly medical officer up here has some more information for you. CMP continuing had about 3 hours of sleep, having had 3 cans of fluid - of water that is, and he ate everything in Meal B but the fruit cake and he didn't use the brownies and the beverage in Meal C.

CAPCOM Okay.

SC Okay, and continuing the CDR's PRD is 17019. He had 3 hours of fair sleep, no medication, and 1 and 1/2 cans of water, and one/half a sandwich. The CMP's sleep was 3 hours and I'll try to get more systematic as we go along here.

CAPCOM Okay.

CAPCOM Jack, we are assuming no medication on the CMP. Is that right?

SC That's affirmed. We haven't gotten that kit out yet.

CAPCOM Okay.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/7/72 CST 15:10 GET 15:37 104/1

SC Gordie, this is Jack. Looks like the windows have cleared up pretty well in PTC from the ice crystals anyway that were on window 1. The hatch window still seems to have a film of something on it, but otherwise they look pretty good.

CAPCOM Okay, sounds good. Jack, while you're there you might try - we've been talking about consumable updates and what would be the most meaningful way to give you the information. As a trial for 14 hours with reference to the charts in the back of the book which in the case of - in case a lot of them are listed in percentages except the RCS which is in pounds. On the cryo quantities when I take all the tank percentages and plot them, it turns out that there is no real significant difference from the lines that are plotted on either hydrogen or oxygen. On RCS your running about 3 percent ahead of the line. And if that's a satisfactory way to put it then that's the way we'll give you the updates rather than giving you every tank percent by percent.

SC Okay, that's good (garble).

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/7/72 16:03 GET 15:36 CST MC105/1

SC Mark 2 aspirins for the LMP.
CAPCOM Roger, LMP.
CAPCOM Jack, next time the surgeon would like a mark
on each individual aspirin.
SC Well, I gave it to you since I swallowed
them both simultaneously.
CAPCOM Rog.
SC I knew they wanted that, Gordy, and that's
why I only gave you one.
CAPCOM Okay.
SC Would they rather have them go down one
at a time?
CAPCOM I'll have to go back to the back room on
that.

PAO This is Apollo Control, 16 hours and
25 minutes. The Crew of Apollo 17 is now presently in a
meal period. A little bit of levity a short time ago when
Jack Schmitt, Lunar Module Pilot, called down to say: "This
is LMP, mark, 2 aspirin." He had mentioned earlier in his
post-sleep checklist that he was considering taking two
aspirins. Apollo 17 is presently 72 843 nautical miles
out from Earth. Velocity 6477 feet per second. We're con-
tinuing to stand by on the air-ground circuit for further
conversation as the crew finishes up their meal period and
gets what few flight plan updates are involved in the days
activity. At 16:26 and standing by, this is Apollo Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/7/72 GET 16:27 CST 16:00 MC106/1

CAPCOM 17, Houston. We see the optic starting to stir there, you can go ahead with a P52, but before you do the P23, we have some updates to it.

SC Hey, Okay, Gordo, we'll do that.

CAPCOM 17, Houston. Can you confirm that you did change your LioH cannister, before going to sleep last night?

SC Well, we can confirm that we didn't. How about that?

CAPCOM Okay.

SC We'll, a-, thanks, thanks for reminding us. We'll try that first thing this morning. I was just getting too tired, and the CO2 didn't look quite that high last night, so I a-, I let it go.

CAPCOM Okay, that's a-, that's fine. We're not concerned about being late with it.

SC Okay.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/7/72 CST 16:21 GET 16:46 107/1

SC Okay, Houston that looks like a pretty good one that time. You note the star angle difference?

CAPCOM Roger, we copy.

SC Okay, I can't see Squat out through that telescope. I just hope it lines it up and does the right thing. Okay, those are the torquing angles and you can let me know when you have them.

CAPCOM Okay, standby.

SC The telescope is no different than any other time. There is just a lot of reflection from the lunar module and even though everybody said that before you don't quite believe it till you see it yourself.

CAPCOM Okay, Ron you're clear to torque it.

SC Okay, we'll torque it 5, 4, 3, 0.

CAPCOM Okay.

CAPCOM 17, Houston. If we can find a stenographer I got some dictation, some pads for you and also a flight plan update.

SC Standby 1, Gordon.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/7/72 CST 16:30 GET 16:56 MC108/1

SC Okay, Gordie. Oh, okay. Stand by. Okay, Ron's ready to copy.

SC P-37 pad's first.

CAPCOM Okay. Okay, the P-37 block data for 35 hours. Well, we've got 35, 45, 55, 65. GET ignition of 03500. Delta VT is 5326 minus 17508139er. For a GET of 04500, 7728 minus 17708118. For a GET of 05500, 5859er minus 17510530. GET of 06500, 4703 minus 175129er40.

SC Okay, I'll read that. Let's see, 3500 at 5326 minus 175 and 8139er at 4500, 7728 minus 177 and 8118. At 5500, it's 5859er minus 175, 10530. At 6500, it's 4703 minus 175, and 12940.

CAPCOM Okay, that's correct. I've got a maneuver pad for you -- it's a fly-by maneuver -- at a time of 81 hours, which is 5 hours prior to LOI. This is required because you're presently on an impacting trajectory, and this is assuming you wouldn't do a midcourse 2. Midcourse 2 will put you on the proper trajectory. If you get a maneuver pad out, I'll give it to you.

SC Okay. That's in work.

SC Okay, Houston, this is 17, ready for the flyby pad.

CAPCOM Okay, Ron. We were just watching your roll angle. You're gonna -- we're going to be updating the optics cal attitude and the roll will be 164, and you're coming up on that. Maybe you want to stop the PTC near that roll angle first.

SC Hey, that's a good idea.

SC Gordie, did you read Jack?

CAPCOM Not clear Jack.

SC I can take the pad if you want to while Ron stops PTC.

CAPCOM Okay, why don't I give you the update to the flight plan, since that'll give you the new attitude and also a change in the star for the P23, and then Ron can get on with that. The pad we can get after that.

SC Go ahead.

CAPCOM Okay. Turn to 17 hours in the flight plan, page 18.

SC Go ahead.

CAPCOM Okay. The VERB 49 maneuver to optics cal attitude right at the top of the page, cross out the attitude numbers and replace them with roll 164, pitch 301, and yaw 348, at a high gain pitch angle of minus 48 and a yaw of 315. Over.

SC Okay, 164301348 minus 48 and 315.

CAPCOM That's correct. Now, go down a few lines to the sighting attitude at 17 hours and 15 minutes, and cross out that attitude and the high gain pitch angle and change to a roll

APOLLO 17 MISSION COMMENTARY 12/7/72 CST 16:30 GET 16:56 MC108/2

of 196, pitch 304, and yaw 348. High gain pitch is minus 61, and the yaw remains the same, 357. Over.

SC Okay, 196304348 minus 61.

CAPCOM That's correct. And, now, on the first star P23, we're going to change the star, so cross out -- replace the NOUN 70 numbers with star 21. That would be 3 balls 21. And, delete the NOUN 88 and the vector numbers there.

END OF TAPE

SC Okay, star 21 and no NOUN 88.
CAPCOM Right, and over on the right where it says Merak, you can write in an Alphard. That's what 21 is.
SC Okay.
CAPCOM Okay, now, down on the next page, at 18 hours 20 minutes, where it says Optics Calibration Attitude, we got to put in the same thing as the same change as above. We want, instead of 175298330, change that to 164301 and 348, high gain of minus 48 and 315. Over.
SC Okay, 164301348, minus 48 315. Over.
CAPCOM Okay. Now, about 10 lines down, delete Charge Battery A. We're going to leave battery A charged for a while longer, since we used up so much of it on the pad last night.
SC Okay, delete battery charge A and you want to leave it on B.
CAPCOM Yes. Right. Flip the page. Might as well clean up all of these checklist changes. At 19 hours 40 minutes, change magazine Kilo Kilo to magazine November.
SC Okay. That's done.
CAPCOM And, then skip a few pages to 24 hours 30 minutes.
SC Go ahead.
CAPCOM At, just above the CSM systems checklist call out there, write in charge battery A.
SC Okay, I got you.
CAPCOM And we'll be leaving it on battery A all night long. Okay, that's all the flight plan changes. I've got that fly by pad when you're ready.
SC Okay, I'm all set.
CAPCOM Okay, purpose is fly by SPS/GNN. The weight is 66839 plus 121 minus 02, correction, the yaw term is a minus 012. Ignition time is 081172103. NOUN 81 is a plus 00911 plus 02041 plus 04593. Attitude is 121153 and 321. Apogee is NA, perigee plus 00212. Delta V total of 05108 117 05063. Sextant stars 260965339. Boresight star is NA, NOUN 61 plus 1557 minus 17500 10999 36243 and GET of 05G is 1532411. GDC align stars are Sirius and Rigel 256152069. Ullage is none. And for remarks, number 1 is Burn Docked, number 2 assumes PGC REFSMMAT, number 3 LM weight 36281 and number 4 is Assumes No Midcourse 2. Over.
SC Okay, Gordy, you read that?
CAPCOM I haven't heard anything since I finished the pad, Jack.
SC Okay. I'll push the other button then. Okay, your read back: fly by SPS/GNN 66839 plus 121 minus 012 081172103 plus 00911, plus 02041, plus 04593. 121153321. HA is NA plus

APOLLO 17 MISSION COMMENTARY 12/7/72 GET 17:06 CST 16:39 MC109/2

SC 00210 05108 11705063 260965339. Boresight star is NA plus 1557 minus 17500 10999 36243 1532411. Sirius and Rigel 256152069. No ullage. Remarks: 1, burn dot; 2, PGC REFSMMAT assume; 3, LM weight 36281 and 4, assumes no midcourse 2.

CAPCOM Okay, one correction on perigee of NOUN 44. That's a plus 00212.

SC Okay, 00212 plus.

CAPCOM And, one additional remark, this results in a 187 mile perigee perilune.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/7/72 17:15 GET 16:48 CST MC110/1

SC Okay, I got that.
CAPCOM Okay, for general information we're
planning mid-course 2 tomorrow at about 35 30, and it should
be about 10 feet per second.
SC Okay.
SC Strangely enough that's even scheduled
at 35 30.
CAPCOM Rog.
CAPCOM One reminder to open the waste stowage
vent valve as shown at 17 hours.
SC Oh, okay. We were going back to clean
up. I think we owe you a LiOH canister change, too.
CAPCOM Rog. We concur with changing it.
SC Alright, Houston, Apollo 17 will maneuver
to the optics calibration attitude now.
CAPCOM Okeydoke.
SC It's funny, you eat potato soup, and all the
soup is all around the outside of the bag and you get a little
hole right down through the middle of it.
CAPCOM How about that.
SC It's just like in 1-G. The spoon isn't
quite long enough to reach the bottom without getting your
fingers on the side of the bowl.
CAPCOM Rog.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/7/72 CST 16:56 GET 17:21 111/1

SC Gordie, I don't know what your weather is like down there, but from here it looks like you're probably overcast today. Might even have a pretty good storm blowing.

CAPCOM Well, it's gray and cold and a little rain so your call is correct.

SC It looks like Mexico in general is pretty nice; although, there is a band of eastwest trending clouds that start from the Gulf of California cross Senora and probably up through New Mexico and over into Texas as far around as I can see. Southern California looks like it's in pretty good shape today, but Northern California looks like it's probably overcast. And a major system probably associated with that that stretches into the northern western United States. But a band of clear weather looks like it stretches from Arizona right on up through I would guess through Colorado, Kansas and probably into the midwest pretty well.

CAPCOM Rog, you're a regular human weather satellite.

SC If Ron would just stop his maneuvers I could tell you some more, but the earth just set behind the LM.

CAPCOM Rog.

SC More specifically it set behind the rover, which may be a space first.

SC Pretty impressive storm system down off the west coast of Anartica.

CAPCOM Roger.

SC And Houston the canister has been changed. Number 3 is in A as per the earlier flight plan instructions.

CAPCOM Okay.

SC Sorry we were late, but we got a little tired last night.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/7/72 CST 17:02 GET 17:28 MC112/1

CAPCOM Uh, Jack, Houston. We'd like you to go ahead and get that waste storage bin open now so we can keep to the schedule on cabin enrichment.

SC Okay, Ron is getting that. Keep nagging.

CAPCOM Thank you.

SC That the same as I had before?

SC Hey, that looks like a pretty good optics count right there. That's three times.

SC Okay. No, that's not (garble).

CAPCOM Ron, we're copying your comments.

SC Okay. Think we'll use that one there for the optics count.

CAPCOM Roger.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/7/72 CST 17:11 GET 17:36 113/1

All dead air.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/7/72 17:45 GET 17:20 CST MC114/1

SC Those were associated with the accumulator
as I recall.

SC Yeah, the random one's are the ones I
was interested in. They just seem to stop. Of course we
haven't been moving switches on 2, but we were getting them
without doing that also.

SC Okay, there's the old star. Works just
like the simulator, you can't see the star when it goes down
in the Earth.

CAPCOM It's still being worked on, Jack, though
we don't have any real concrete story to give you on it yet.

SC Okay, it seemed to be pretty quiet last
night, so that's the only problem. Okay, Gene, you want to give
me CMC 3.

SC Okay.

SC Ah, let's see. 375 okay, that's
not too bad. (garbled)

SC (Coughing.)

SC Yeah, I don't know what's ---

SC Okay, those (garbled) punch a hole in it.

PAO This is Apollo Control at 17 hours 54 min-
utes. The change of shift press conference is ready to begin
at this time in the MSC News Center Briefing Room. We'll
take down the live air-to-ground, record, and play back
immediately following the press conference.

END OF TAPE

PAO This is Apollo control at 18 hours 29 minutes. During the change of shift press briefing, flight director Gene Kranz reviewed the status of the mission with each of his flight controllers everything essentially normal at this point. Flight dynamics officer reported that they have not yet gotten sufficient tracking on the S-IVB trajectory to give an impact point based on tracking. We should have that in a matter of hours. And we'll get a report as soon as a set of coordinates for the S-IVB impact are available. Also, capcom Gordon Fullerton read up a news report to the crew. And it's been relatively quiet for the past 5 or 10 minutes on the air to ground line. We'll replay the accumulated tape and as soon as we've caught up with the tape we'll stand by for live conversations with the crew.

SC That's five on that star. Could you concur that's five on that star, Houston?

CAPCOM Stand by, let me check.

SC I think it was. I'll take another one just in case.

SC Okay, Gene CMC auto.

SC All right 20 okay that's far horizon. Plus 02745 plus 99128 28 enter plus 12885 12885 12885 okay. Okay, want the 180 option no, computer check me 2 Betelgeuse. Okay, this is earth far horizon. Bunch of old ones, yes, I got it, okay, since we're there - okay this is the old star of (garble). Okay, it's the far horizon double line is down in the earth GDF, reach up a little bit here. Okay, didn't do such a hot job of putting them on there. Do you want to go to CMC free? Okay, give it a flip that way and a flip that way and a yaw that way two yaws that way. (singing) holy mackerel. That was a good mark.

SC Gordie, this is the LMP.

SC Hello Houston, 17, how do you read?

CAPCOM Go ahead.

SC You got any news today to read up to us?

CAPCOM Yes, as a matter of fact we have a little bit made up here. I guess more on the personal line. We checked with Barbara and Jan and the kids and they're all back home safe and sound and they mentioned that they're going into they're going into their own personal quarantine period they are glued to the squawk box. Over.

SC I was afraid you were going to get to personal there for a minute.

CAPCOM I'll run down a few quick summaries of this mornings news. Former president Harry Truman has rallied slightly despite his weakened heart and labored

CAPCOM breathing. His doctors report that their main worry is whether or not he is strong enough to withstand the strain the physical strain of 88 years despite the slight rally Truman's condition is still considered critical. In Paris Henry Kessinger met with Hanoi's Le Duc Tho for four hours yesterday in planned secret talk. Paris newspapers report that eminent cease fire, but neither Kessinger or Tho indicate that this is true. After the four hour talks Kessinger shook hands and his aid, but neither representative made any comment concerning their meeting. At Camp David Maryland President Nixon's press secretary Ronald Ziegler said that Kessinger and Nixon are in close communication by cable concerning the secret peace talks. Ziegler declined to provide more information about the progress in the talks. President Nixon selected Claude S. Brenniger a California oil executive and a doctor of economics to be secretary of transportation succeeding John A. Volpe. Volpe will become U.S. ambassador to Italy. Here's one concerning last nights launch. Mrs. Spiro Agnew reportedly made a wish on a falling star just before the delayed launch of Apollo 17. Sitting beside there at the VIP viewing site was Barbara Cernan who said that she was nervous when the liftoff was postponed. She added that Al Bean was there with me he said not to be concerned. Mrs. Cernan was accompanied by her daughter Tracy and her mother Mrs. Jackie Ashly. Mrs. Ron Evans who saw the launch with her children Jamie and John said that she was never worried because everybody knew what they were doing.

SC Laughter. Good summary Gordo we thank you and our best wishes for the return health of Mr. Truman.

CAPCOM Roger.

SC Gordo, we were figuring up here that we probably launched on the 6th of December in Houston and on the 7th of December in Florida.

CAPCOM That's right you call it right.

SC Okay, CMC auto there Gene, please. Oh boy. Okay, let's use the verb 23 enter, ah, what did I do there. Enter, let's see is 110. There okay. Verb 25 enter okay my prime Veotus. (Coughing). Okay.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/7/72 18:11 CST MC116/1

SC Okay, minus, 8490, 84900, next. Plus 40299, plus 40299, entered. Plus 34176. Entered. Okay, proceed. 202 18 and okay. There already. (garbled) Try one more time. In CMC AUTO. 196306. Gordy, you still there? That's right.

CAPCOM Go ahead, Jack.

SC I mentioned to Bob yesterday how when we moved away from the Earth how fragile a piece of blue it looked to be and that impression certainly grows the further you get from it. I wish everybody could have a chance to get that impression. Things might go a little easier for us.

CAPCOM Roger.

SC Okay, Gene, you are in CMC (garbled)

SC (singing) You must be making the vector worse and worse instead of better. (laughing) Well, (garbled) the star points, half way through the Earth almost. Not really.

SC Gordy, we haven't really had a clear and detailed description of what you or somebody else saw at the launch, in terms of the lightning around the countryside, the state of the flame and how long the exhaust was under the S-1C. Do you have anything to add to that?

CAPCOM I can tell you my feelings anyway. There was a spectacular sight. There's no doubt about it. I'd say the level of illumination would have made it easy to read a newspaper or anything like that from my vantage point near the VAB. The plume itself was, actually looked no larger or even any brighter, really, except in contrast than it does on a daylight by comparison. But, oh, the effect I guess is about what I expected. Just trying to extrapolate previous launches into a night time situation. The weather was very clear. That was one advantage gained by delaying the launch the 2 hours and 40 minutes that we did. By that time there were very few clouds around at all. And we could see a brilliant light there when the first stage cut off and the second stage ignited. And I lost you visually probably, oh, 4 to 5 minutes into the second stage as best I can remember. Part of the problem was the brightness of the plume during the first stage. It kind of burned a spot in my eyes, and so then I was - had reduced efficiency at looking for a small point of light from there on out. Stu's here with me and he was watching it to. I'll see if he has anything to add.

SC Stu, who?

CAPCOM He said after that comment he has no comment.

SC (Laughter) I'm sorry, Stu. I can't believe that, Stu always has something to add. (singing) Alright, you said in case you just noticed I forgot the first 67 until just now. Although, in reality all we're trying to do here is get a DELTA H measurement anyhow.

APOLLO 17 MISSION COMMENTARY 12/7/72 18:00 CST MC116/2

And you got any feel yet for what the DELTA H line has (garbled) been?

CAPCOM Standby, Ron.

CAPCON Ron, this is Houston. We're not going to be able to give you a handle on the Delta H until we have a chance to take all the data and reduce it and work it around a little.

SC Okay, that's mighty fine.

SC Okay, (garbled) Okay, here's the far horizon. 2, 3, enter, 1, 2, 3, 25 here. (singing) Have an 0, 7, 3, enter plus F064. Enter there. Okay. That is the unit vector of the star. Okay, it's the 180 option we don't want. Get me the real option. I guess - Houston, you must be getting all the good data without the high gain, huh?

CAPCOM That's affirmative, Ron.

SC Okay. Okay. Let's enter that. Okay, Gene, go CMC 3 now. Okay, go CMC 3 now. Yeah, that's about a half a sextant in diameter above the horizon. The star point looks pretty good though. A (garbled). Not yet. Yeah, it's on --- There A CMC auto. Now, last star What was that? Going to go back to the calibration attitude. Okay. CMC auto in caged and away we go. Used up the waste water too - 2 percent. 164 301 and 318, that's a optics calibration attitude. We want to start with linemark line of sight mark on star 22. Put the (garbled) Also the optics line of sight. See the optics (garbled)

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/7/72 CST 18:21 GET 18:46 MC117/1

SC Okay, Houston, looks like optics calibration is 89 995, I get that half the time and 997 the rest. So we'll use 995 I guess.

CAPCOM I - -

SC Okay, Houston, you ready for some purges and dumps?

CAPCOM Let me make sure here. Standby.

SC Well, I had my clock on the wrong scale. Is that about 2 minutes, Houston?

CAPCOM That's good, Jack.

CAPCOM Did you copy that, Jack? They said that was fine.

SC Yes sir, Stu, I copied that. How are you?

CAPCOM Okay, swinging.

SC That's good to hear.

CAPCOM Sure am enjoying your descriptions.

SC Well, if I could get Ron off his work with the optics, I'd look at the Earth some more. But that will come. Right now I'm seeing all sorts of little ice crystals of various composition, that are moving around and everyone of them bounces off the LM that I can see. No, none of them stick. I noticed that some of them will go into a corner with a fairly high velocity and either be turned around by a double bounce, or just get lodged in the corner and have very low velocity when they come out.

CAPCOM Roger.

SC Most of them look like they have at least a foot or two per second.

CAPCOM Roger.

CAPCOM Hey Jack, I'm surprised when you said when you got Ron off the optics. Don't tell me that Ron is going to let you look through his optics.

SC Oh heavens no, we just move the window.

CAPCOM Okay.

SC That's for sure.

PAO The CAPCOM at the present time is Astronaut Stuart Roosa, backup Command Module Pilot for Apollo 17.

SC Stu, apparently you do get some particle - particle collisions, because some of the trajectories are back towards us.

CAPCOM Okay, we'll wait for the explanation of that.

SC Well, I think it's because the particles, some of them are bouncing off the LM and get out into the stream which normally would have no collision. How's that?

SC You can say it's not very good. I don't care.

CAPCOM Got to use tact here.

END OF TAPE

CAPCOM We have animated description of the behaviour of a cloud of ice crystals drifting along with spacecraft is coming from Jack Schmitt. Apollo 17 at this point is 81 654 nautical miles from Earth, traveling at a speed of 5972 feet per second. And we see from the telemetry data that the fuel cell purge called for in the flight plan at this time is progressing. This involves flowing, in this case, oxygen at a high rate through the fuel cell for a short period of time to remove any build-up of contaminants. And, as a routine maintenance or housekeeping procedure, same thing is also done periodically for the hydrogen.

CAPCOM You can terminate the purge on fuel cell 3-02.

SC Yes. I even forgot to listen for the bing on that one. Thank you.

CAPCOM 17, we'll be having a communications hand-over to Honeysuckle in about a minute and a half.

SC Okay, Gordo. That's great. Next time I look at the Earth, I'll see what's happening in Australia.

SC Okay, Houston. We're starting our waste water now. Wish us luck. Wish us luck. Yes, that really goes out.

CAPCOM Can you give us POO and ACCEPT and we'll give you a new state vector?

SC Probably need one after all those marks. Okay, you've got POO and ACCEPT.

CAPCOM Roger.

END OF TAPE

CAPCOM
computer.

Okay, the vector's in there, it's your

SC

Okay, Gordo, thank you.

PAO

This is Apollo control at 19 hours 7 minutes. The crew aboard Apollo 17 has completed the next item in the flight plan in the way of housekeeping duties aboard the spacecraft. That involved dumping waste water. Water is accumulated in a 7 to 8 gallon tank on the spacecraft which is produced as a by product of generating electricity in the fuel cells. These fuel cells generate quite a bit more water than the spacecraft is able to consume for cooling and for crew drinking purposes. The excess goes into a waste water tank and periodically it's dumped down to about 10 percent, and the crew has just completed that activity. We're going to take advantage of a relatively quiet time in the flight plan at this time to replay a portion of the air-to-ground conservations with the spacecraft which included among other things a rather detailed description of earth given by Jack Schmitt, some weather patterns. This replay is necessitated by a problem that we had with a portion of the public affairs release circuit between 4:40 and 5:05 p.m. central standard time this afternoon in which a portion of the release circuit did not receive the air-to-ground and for the benefit of those people who missed that portion of air-to-ground we'll replay the tapes at this time.

END OF TAPE

PAO This is Apollo Control at 19 hours 33 minutes. That completes our replay of the segments of the air-to-ground that were lost on a portion of the Public Affairs Release Network earlier today. During that replay, we accumulated about 5 or 6 minutes of additional tapes with the crew, how the activities involved during that period of time or completion of waste water dump, the crew dumping excess water produced by the fuel cells and stored in a storage tank on the spacecraft, and they dump it down to about 10 percent of its quantity, or its capacity. And, also completed one other routine housekeeping activity. That was cycling the film in the panoramic and mapping cameras contained back in the service module scientific instrument module bay. That bay, of course, still has the door over it. The door will be jettisoned before going into orbit around the moon exposing those cameras for use in lunar orbit taking high-resolution and very accurately controlled mapping cameras -- or mapping photos of the lunar surface. The cycling of the film is made necessary by the fact that the film is under some tension in the magazine in the transport mechanism. This tension tends to put pressure on the emulsion, and if the film is not advanced, oh, four or five cycles, at least once every 24 hours, it tends to create striations in the emulsion, and this is done during the translunar coast when the cameras are not being used periodically, once a day to prevent these striations from developing in the emulsion of the film. We'll replay that accumulated tape for you and then continue to stand by live.

SC (garble) Are you going to want to cycle some film here?

CAPCOM That's affirmed. We're planning on it. Try and make sure they're ready, though, before you do it.

SC Well, I didn't want to bring it up, but you're about 20 minutes late on your cue.

CAPCOM You must have missed our first call.

SC I probably did.

CAPCOM Jack, we're ready for the pan and mapping camera film cycling. You haven't started into the procedure yet, is that correct?

SC No, not yet.

CAPCOM Okay, at your convenience, we're ready to watch you do it.

SC Okay. And, with those last high-gain -- I guess they're still good, huh? You want the high-gain on it?

CAPCOM Okay, we'd like you to use pitch at minus 50 and yaw at 320 and acquire the high gain.

SC Okay, will do.

CAPCOM You have 10 percent waste water now. You can terminate the dump.

SC Okay. We're just about there.
SC Okay, (garble) motion is off.
CAPCOM Roger.
SC The systems are going on. AUX TV is going
scientific.
CAPCOM Jack, we'd like auto and NARROW on the
high-gain.
SC There you go. Okay?
CAPCOM Thank you.
SC Okay. SMAC power is coming on.
Mapping camera is going standby, (garble). And, mode is
verified in standby.
SC Pan camera mode's, yes. Okay. Pan camera
has gone to power. Now, barber pole (garble). Okay, the
pan camera just went to power. Okay, Ron's talking to you.
Didn't know that.
CAPCOM Roger.
SC Pan camera's self test has gone to
heaters.
SC High-bit rate. Okay, waiting your cue
Gordie.
CAPCOM Okay, stand by. Okay, Ron, we're ready
for the film cycling.
SC Okay, mapping camera is going on. Okay,
pan camera's self test is going to self test like next barber-
pole. Okay, I forgot to time it, yeah. Okay, talk back when
ready on the pan camera.
CAPCOM Roger.
SC Okay, pan camera's power is off. Okay,
mapping camera is going off. Okay, SMAC power is coming
off, huh?
SC Okay, Houston. Film cycling is complete.
CAPCOM Okay. It looks real good on both cameras.
SC Very good.
SC Okay, Gordie. If your friends there
on your left are wondering what strange sounds they're hear-
ing, I just got the harness on.
CAPCOM Roger.
SC And, then, I guess if you're through with
the high-gain, I'll go back to Omni BRAVO.
CAPCOM Okay. We concur with that idea.
SC And, if I could ever get Ron out of the
kitchen, we'd get it into PTC.
CAPCOM Jack, you'll be glad to know your heart
is beating normally. We have a good signal.
SC Just so long as it's beating, Gordie.
About 20 hours ago, I wasn't so sure.

SC Gordo, we're maneuvering to the PTC attitude now.

CAPCOM Okay.

SC Houston, Apollo 17. Any recommended quads for damping the PC RCS?

CAPCOM Stand by on that, Ron. We'll give it to you in a minute.

CAPCOM Ron, we're recommending AB for damping and BRAVO Delta for roll spin up. I'll say again. Alpha Bravo for damping and Bravo Delta for roll spin up.

SC Okay, Robert, and welcome back aboard.

CAPCOM Roger, sir.

SC You know, this eating in zero G's is not so bad if you keep your bags right side up. If you keep them that way, you get the right prospective. It's sure something funny if you turn the bag upside down, and it still doesn't fall out.

CAPCOM Roger.

SC Having a little peach ambrosia for a snack here.

PAO This is Apollo Control. That - -

END OF TAPE

PAO This is Apollo control. That completes our replay of accumulated tape we'll now stand by for any live conversations with the crew. One thing additionally that we get out of cycling the cameras the panoramic and mapping cameras as an indication of how they are performing mechanically. As you heard based on the telemetry data that we got here on the ground both cameras appear to be functioning properly tucked away in the scientific instrument module bay of the CSM. You also heard some conversation with Jack Schmitt who is wearing the biomedical harness during sleep periods it's customary for one of the three crewman only to wear the biomedical harness which allows them to get heart rate during the sleep period and the crewman take turns wearing that biomedical harness and during the sleep we are getting good biomedical data good heart rate data on Schmitt at the present time. Also, Ron Evans commented on getting the spacecraft in the PTC attitude. Essentially, this attitude has the spacecraft oriented at right angles to it's direction of travel. Right angles to the Earth Moon plane so that the Sun is essentially shining on the sides of the vehicle of the CSM and LM. And, then using the reaction control system thrusters on the command module they set up a slow roll rate so that the two vehicles docked together are rotating at the rate of about three revolutions per hour. And, if this is done properly and it's a tricky maneuver usually crews get more and more experienced at it as they go through the mission, and tend to have the most problems early on in getting it set up. But if it is set up with all of the rates damped and everything very stable when the roll is started it will maintain this roll without wobbling out of it throughout the rest period. The purpose of this is to maintain a proper thermal equilibrium on the spacecraft so that the heating on one side from the Sun the cooling of the other as it is exposed to the black of space is uniform and nothing gets too hot or too cold. At the present time Apollo 17 is 84 482 nautical miles from earth and the velocity continuing to decrease gradually down to about 5 824 feet per second just a little over one mile per second. We'll continue to stand by live now for any conversations with the crew. This could continue to be a relatively quiet period based on Ron Evans or I guess it was Jack Schmitt's comment that Evans was in the kitchen leads us to believe that they are probably getting ready to eat. This is Apollo control at 19 hours 45 minutes.

END OF TAPE

PAO This is Apollo Control at 19 hours 51 minutes. On the telemetry data that we have here in the Control Center, we're watching as the spacecraft is automatically killing off its rates, in preparation for setting up it's passive thermal control mode. They're getting the vehicles very stable, and they're measuring rate changes in thousandths of a degree per second. And when it is as essentially as stable as it appears possible to get it, they'll then fire the thrusters, to begin rolling at a slow 3 revolutions per hour rate. This is the second passive thermal control mode established.

CAPCOM The rates are looking good, they're amped adequately. We're ready for spin-up.

SC Okay, Bob.

PAO The crew set up the spacecraft in the passive thermal control mode before their previous sleep period and experienced no difficulty, and they appear to be going very smoothly. In this passive thermal control setup you heard CAPCOM Robert Overmeyer who's come in to relieve CAPCOM Gordon Fullerton, advise them that the rates have been killed off sufficiently to begin rotating the vehicles now.

SC Okay, Gordo, we're in PTC. Or Bob, I guess you're down there now.

CAPCOM Roger, Gene.

SC Bob, did you ever find out what part of Antarctica we were seeing at various Earth orientations?

CAPCOM Jack, I've tried this afternoon and I couldn't get hold of anybody and I looked on map for awhile and I'm not sure where little America was. I can't truthfully say I did it. I'll keep looking at it.

SC Okay, at any rate, it looks like there's a very well developed front coming out of the northwestern portion of Antarctic ice shelf. And the front, and let's see here. Stand by 1. Have to change windows.

CAPCOM Roger.

SC Okay, Bob, that front, looks like it starts and develops as a small, it actually seems to start with an anti cycle in development off the coast of Antarctica. Moves up across New Zealand. Looks like the south island primarily, a little bit of the north island is still visible. And into the eastern coast of Australia, I'll give you a spot where it intersects and crosses the whole of Australia. However, it breaks up and is not very well formed, once it gets inland away from the coast. I see no well developed waves on it at this time, so it's hard to say how strong it is. There might be one developing just to the south of New Zealand, or right off the coast of New Zealand.

CAPCOM Roger. I copy that, Jack.

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SC There at least some sinusoidal motion
or appearance to the front, and you'll have to wait because
I lost it again.

CAPCOM Roger.

SC I took two 50 millimeter pictures, mag
November, November is on 132.

CAPCOM Roger, November, November on 132. Those
are pictures of the ...

SC And that was that - -

CAPCOM Jack, Houston. Were those pictures of
those fronts you were talking about?

END OF TAPE

PAO That was Jack Schmitt giving us the description of the weather patterns developing off the northwest coast of Antarctica and extending up towards New Zealand and Australia. Apollo 17 at the present time is about 85 500 nautical miles from Earth and situated over the south Pacific. The spacecraft now essentially fixed with the respect to the Earth and Moon, but the earth rotating beneath it as the earth rotates - -

SC Orbital map out now and that front is going off across the coast of Australia north of Sydney and largely a little south of Brisbane. And swings across the whole of Australia and seems to come as near as I can tell go by into the Indian Ocean about well where the great Sandy desert intersects the northwestern coast of Australia.

CAPCOM Thanks Jack.

CAPCOM 17, I've got a flight plan update here.

SC Stand by, please.

CAPCOM Rog, it's just a short one, one item to change.

SC Well, if you saw my hands right now you'd know why I said wait one.

CAPCOM Understand I'm just waiting for your call didn't want you to think we're going to give you a whole (garble) rap of it.

SC Oh, we know you wouldn't do that.

CAPCOM If your eating Jack just go ahead and eat this is nothing that can - we can just wait and anytime just go ahead.

SC Yeah, I'm not panicing.

END OF TAPE

SC Okay, Bob go on the update and LM CM Delta-P at 20 (gable).

CAPCOM What do you know Jack we just got cut out by the antenna switching. Say again the LM CM Delta-P.

SC Okay, 0.6 at 20 plus 09.

CAPCOM Roger. Okay, my update is just simply on the bottom of page 3-23 at 23 hundred hours in the flight plan or 23 hours in the flight plan. Waste stowage vent valve closed just delete that one and move it over to 2430 that's because you got started late on that.

SC Okay, you could have just said move it.

CAPCOM Okay, just change it down to 2430.

SC 2430.

SC Okay, Bob revision 1 on my previous scratching of the letter on Australia that front does cross probably Brisbane is probably cloudy it does cross about that area and however there is a bank of clouds that runs off of it down the coast line so Sydney is either cloudy or has some pretty nice clouds off shore. And the remnants of the front as it dissipates in the Hinterland of Australia dies out at about the Great Sandy Desert and there is not a good indication that it crosses into the Indian Ocean. But, we're getting over near the LM and that's a little hard to tell.

CAPCOM Roger.

SC Now, it looks more and more like there is a cyclone circulation developing right over the top of New Zealand the south island I think. And now I'm looking with the Binoc and as much as anti cyclone circulation is centered on the ice shelf and I think that well I just don't know I think that's the Ross ice shelf I'm not sure off Antarctic and the clouds from that circulation do extend over the ice shelf and barely onto the Antarctic continent.

CAPCOM Roger, Jack.

SC Now to the north of Antarctica. let's see now I ought to give you a better orientation than that. Anyway, there is a large cyclone circulation pattern that has its southern extremity right on the edge of the ice shelf. And that is east by 20 or 30 degrees longitude on the front that I was just discussing. The way that front intersects Antarctica.

CAPCOM Roger Jack.

SC Between New Zealand and Australia the front I was discussing previously has some fairly strong transverse cloud patterns it's hard to say whether they are high cirrus or not, but the clear area to the south of the front suggests that maybe the jet stream is roughly parrelling

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SC that front in that area.

CAPCOM Roger. I'd have to look up and see if they do have any jet streams there right now.

SC If I had to guess if you were flying west from Sidney this afternoon you'd have a pretty strong tailwind behind you, Bob.

CAPCOM Roger.

SC Did I get that right.

SC Would you believe a headwind?

CAPCOM Okay, I'll believe that.

SC But, the bulk of Australia is very clear all the south and the north. It's just that one line of clouds that crosses the center section.

CAPCOM Roger.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/7/72 GET 20:17 CST 19:51 MC125/1

SC That put all the major cities of the South, Perth, Adelaide, at least, and Melbourne certainly in the clear. And in the North Darwin, in those areas, are very nicely clear today.

CAPCOM Roger. I hope we can get this out to them and let them know you're watching and tell them how good the weather is.

SC Oh, that's alright. I'm just having fun, Bob.

CAPCOM Understand. I imagine they'd appreciate it, though.

END OF TAPE

SC Bob, I tried to pick out the Hawaiian Islands on that last little turn here through window 5. And I can't say that I did. I think I've got 'em - the area spotted. It looks like they might be under some fairly heavy cloud cover today. I do not see the islands. I'm not sure I could if ---

CAPCOM Roger.

SC Hey, Jack, I got some answer to your question last night on where Little America is with respect to on Antartica.

SC Go ahead.

CAPCOM There's an indentation that looks like a gulf, that's called the Ross Sea, and on the northwest edge of the Ross Sea, is Little America. That's the location of it.

SC Okay, and that would be the coast of Antartica that sort of faces New Zealand and Australia. Is that correct?

CAPCOM Negative. According to the map I've got. The Ross Sea looks like it would be more facing up towards South America area. It's actually kinda facing up sort of the middle between Australia and South America, Jack.

SC Okay, Bob, you cut out, and I presume you meant the Ross Sea was facing north toward the Pacific between South America and Australia.

CAPCOM That's affirmative, Jack.

SC It's a very sharp indentation or sea or gulf onto the Antartic ---

SC Okay, I think I know the area you mean and I'll check it out again when it comes by.

CAPCOM Okay. That's Little America on that west northwest edge of that Ross Sea. That's where Little America is.

SC Yeah, all that - those names are familiar. I just have forgotten my geography. I'll see if I can recognize them.

END OF TAPE

PAO This is Apollo Control at 20 hours 45 minutes. We're occasionally picking up a bit of noise on the Air-to-Ground circuit. This is due to the fact that the spacecraft is in the passive thermal control mode, as it rotates. We're gradually losing contact through one of the OMNI antennas and re-establishing adequate signal strength on another one. And as it moves from antenna to antenna on our coverage, we get the noise. This is a characteristic that becomes more pronounced as the spacecraft gets farther and farther from Earth. Here in Mission Control, the Flight Activities Officer has been actively involved in figuring out how in the flight plan we're going to make up for the 2 hours 40 minutes difference from the flight plan liftoff time and the actual liftoff time. One of two things happen when you lift off late for a mission. Either the events that are called out in the flight plan occur at a different Earth time, Central Standard, Eastern Standard, or Greenwich Mean whichever reference you happen to be using, or the elapsed times change. And the flight planning is all done in terms of elapsed time for the most part. Events that are called out in the flight plan are listed by the amount of time that has elapsed from liftoff. At the present time, in the Apollo 17 flight plan, the amount of time that has elapsed since liftoff is unchanged from the pre-mission flight plan time. However, as, by the time we have approached or reached the Moon, because of the speeded up translunar coast time, occasioned by slightly faster or slightly greater amount of energy that was put in during the translunar injection burn, we'll have to make up 2 hours 40 minutes. In other words, we'll be arriving at the Moon 2 hours 40 minutes earlier than flight plan allowed for. This means that all of the events that are called in the flight plan to occur between now and lunar arrival have to be accomplished in 2 hours 40 minutes less time than the flight plan allows for. This creates no serious problems, because it's a relatively quiet period of the mission. It's very easy, by adjusting sleep period slightly and moving the activities up to accomplish it. However, the flight planning officer, flight activities officer, prefers to accomplish this shift in two increments rather than a single one. And this could be likened to a change of daylight savings time, where you don't want to make the jump too big at once, and you might start interfering in a way that would be noticeable, say, with sleep periods. But by accomplishing it in two segments, the change is relatively insignificant. And what this amounts to is that at two different times in the flight plan, we'll read changes to the crew, and they will go down the flight plan, moving a

PAO series of events approximately 1 hour earlier. The second time that this is done, they'll actually be moving events 1 hour 40 minutes earlier and at the same time, we'll update the clocks in Mission Control, the Ground Elapsed Time clocks, which serve as the key to where you are in the flight plan to agree with the changes we have made in the flight plan. And from that point on, the GET clock will be back in synchronization with the flight plan. This clock update is presently scheduled to occur at 66 hours Ground Elapsed Time, rather at 67 hours 40 minutes Ground Elapsed Time, and we'll move the clocks to 66 hours. Apollo 17 at present time is 88 091 nautical miles from EARTH.

SC Checking on the Ross Sea, and if I've got her pegged right, it's got a fair amount of open water in it this time of year.

CAPCOM Roger.

SC Although, it's completely surrounded, I think, completely surrounded, I think by portions of the ice pack. And off to the west of there, it looks like there's an area that might be clear of snow, and if my memory serves me correctly, that's where MacMertle Sound is, and some of the dry valleys?

CAPCOM I believe so. That's the Little America area right now, all that general vicinity, Jack.

SC Okay, it looks like the prime recovery area. The Samoa Island region is clear and my guess would be from the fairly subdued zero phase point, that they might have fairly nice seas out there. The boys on the Ticonderoga are probably enjoying themselves immensely, I hope.

CAPCOM Roger.

END OF TAPE

SC Indonesia looks like it's having a nice day, with the possible exception of the region over just north of Australia. New Guinea and that area some clouds in there I can't tell whether they are high or low clouds though they look like they're probably fairly high clouds. But north of New Guinea there is a strong concentration of clouds although small and looks fairly dense like there might be a little tropical depression in that area.

CAPCOM Roger.

SC The folks in Carnarvon ought to be enjoying a very nice day. I've been trying to spot tropical storm Teresa which a couple of days ago was in the Phillipines. I don't think I quite have that visible to me right now.

CAPCOM Roger Jack. Say, you might want to put something in the back of your mind here a minute we made a run of the DSE recording just now of the TLI to get an idea of the quality of the DSE recording and Gene came through loud and clear. Ron was very weak and almost unreadable and we never caught you Jack. Maybe you weren't saying anything during TLI, but we never did catch anything you said.

SC Okay, I don't recall talking to much during TLI.

CAPCOM Roger, understand. Now Gene came through real loud and clear so whatever technique he was using went on that tape real well.

CAPCOM Hey Jack, Houston.

SC Hello.

CAPCOM Hey, Jack just a couple more comments on that DSE. I think as you well know it's very critical on the position of your boom there and those areas that you are critical in make sure that you've really got those beauties up or your talking right in to it and this really makes a difference because the DSE - the volume is fairly low, and if you're muddled just the least bit why it's going to be difficult to pick it up. So talk slow and get right up next to the mike as I know your doing, it just that some voices come across a little better than others.

SC Roger Stu, thanks for the comments as a matter of fact you probably called it just right I think during - once I got the helmet off I loosen up my chin strap and my mike had moved away from my mouth some. And I'll keep that in mind. Thanks for the reminder.

CAPCOM Yes, that's probably the most critical item is that - is the position of those and this has been true in the past and it just really makes a difference in being able to pick up the data off the voice.

SC Roger I've - Ron and I did some experimentation with that in the chamber and couldn't agree more. But, I sometimes don't remember it. Thank you. Okay, go ahead, Stu.

CAPCOM I'm sure your aware of that, but I think the fact that the volume is down just accentuates the problem.

SC Okay, Gene had something he wanted to ask you.

SC Stu, I just thought you would like to be aware of it as much time as we've all spent down at the Cape probably May is one of the nicest months down there however, having had the opportunity to be up here during May I find out that it's not nearly as nice up here.

CAPCOM Okay.

SC And, I'd like to thank all my friends for that.

CAPCOM Okay.

PAO This is Apollo control at 21 hours 3 minutes. Things continuing to progress smoothly and very quietly here in mission control and aboard the spacecraft. And we'd like to have a bit more discussion of the ground elapsed time update after first making the disclaimer that GET clock updates are not done for the purpose of confusing people; although, I'm sure it seems that way at times. And, by way of clarifying the previous description of this GET update we should point out that the amount of time that the clocks are changed both here and mission control and aboard the spacecraft will be 2 hours and 40 minutes and this clock change is scheduled to occur as mentioned previously at about 65 hours ground elapsed time. In other words when the clocks here in the control center and the clocks in the spacecraft keeping track of the time that has elapsed since liftoff reach 65 hours they will be arbitrarily jumped ahead 2 hours and 40 minutes so that at that point the clocks agree with the flight plan. However, in order to account for these 2 hours and 40 minutes which are suddenly going to disappear from the amount of time available to the crew to accomplish their activities to make it easier on the crew it will be done in two increments. The first increment of 1 hour and the second increment of 1 hour 40 minutes. And, at about the time the second increment of change is made in the flight plan we'll also simultaneously update the clocks. Apollo 17 at this time 88 909 nautical miles from Earth and the velocity continuing to decrease gradually down now to 5 603 feet per second. Very little activity is scheduled in the flight plan between now and the time the crew begins

PAO it's rest period. This day aboard the spacecraft has been planned as a relatively short one recognizing that the crew would not get a great deal of sleep on that very long - as a result of the very long launch day. And a relatively short sleep period following. This day was intentionally kept short. They're now - should be completing their eat period although they really have nothing showing in the flight plan until about 22 hours or about another hour from now where they have alloted time for an exercise. They will be changing the lithium hydroxide canisters that remove carbon dioxide from the spacecraft cabin atmosphere. They will be realigning the spacecraft platform the stable platform that's used as an attitude reference by the guidance navigation and control system. Then they have one more eat period and go through the pre sleep check list beginning an 8 hour rest period at about 25 hours ground elapsed time or a little less than 4 hours from now.

END OF TAPE

SC Bob, you with me?

CAPCOM Roger. We wouldn't go away, Jack. We're listening. Did you call?

SC Well, I just -- yeah, I almost lost a pass here and just a couple more words about Australia. As a general land mass, it's red. Very strong red hues, except for the north and eastern coasts, where that red gradually merges into a greenish-gray. It's as red as portions of northern Africa appeared to me yesterday.

CAPCOM Roger.

SC Very striking color. It would be more of an orange-red, really, with brown subduing it. It's obviously not crimson or anything.

CAPCOM You think it's a function of sun angle, Jack, or is it just a red like we see out in the New Mexico area sometimes -- some of the areas?

SC Yeah. No, it's not sun angle, because that'll hold a good red color right in towards sunset or sunrise. It's due primarily, I'm sure, like most desert areas, to the oxidation of the iron-bearing minerals in the sands and rocks in those regions.

CAPCOM Roger.

SC Getting limonite and hematite. Little geology thrown in there, Bob. Sorry.

CAPCOM That's all right. Gotta keep you warmed up for the next couple of days.

SC I think the flight plan will probably keep me warmed up, too.

CAPCOM Roger. We thought that time around T & D was just outstanding.

SC Hey, Bob, I think we pretty well got impressions from you down there on that night launch. I might give you a few of mine.

CAPCOM Go ahead, Gene.

SC (garble) right there.

CAPCOM You're right on the edge if you read me. We're getting a lot of static. If you'll just hang on a minute, we'll be back in to some calm air. Gene, Houston, go ahead.

CAPCOM We're just standing by for your comments you wanted to make when we lost comm there a minute. We're back with you.

SC Okay, Bob. The entire boost itself was not unlike what you - Stu - down there understand. The physical cues, what have you, but the significant part of going at night is that as soon as we did have ignition down there

in the bottom of the S1C stack, even though I only have a little slit out of the rendezvous window here, and Ron doesn't have much of a hole in the boost protective cover out of the hatch window, we could definitely confirm ignition because we could see the reflected lights on out through -- in front of us. It was by no means blinding, of course, we had the cockpit pretty well lit. We -- as soon as we lifted off, that light immediately went behind us. We came into S1C staging, and I had an opportunity to say "I told you so" to Jack and Ron. It was just like the great train wrecks of the past. I definitely could see the S2 ignite, and, then, of course, I could see the significance of the reflection through the window. Besides all the other cues we had for ignition, very much like the S1C lit up the windows on the stack. Power jet was pretty spectacular. I could see out the entire boost protective cover, and some flames from somewhere -- I'm not sure -- maybe it was through the hole in the window -- but I could definitely see it. Of course, it disappeared in short order. When the S11 shut down, the delay time between shutdown there and the S-IVB igniting, the entire flame overtook us, and we literally flew through the S11 flame when the S-IVB ignited, if you can imagine that. It's very similar to the Titan staging where you actually fly through the fireball on the S11. And, that's something you never see -- none of those things you ever see quite that way in daylight. On the S-IV I could see -- of course, once we got going, I couldn't see any light from that plume again, but we could see the APS firing all the way through the burn, and once we got in orbit, as other guys have seen, you could see the APS firing that night without any difficulty. One of the most significant things about TLI is the fact that we, of course, started at night and flew right on up and through a sunrise which in itself was a pretty spectacular thing, but, when you do it during a TLI burn it even adds a little bit momentum to your effort.

CAPCOM Roger, Gene. Any comment you might make on the possibility of picking up your yaw, if you'd lost your platform that time -- remember the discussion we had about the yaw in the late like a mode force went in?

SC Yeah, Bob. I not only will comment. I was aware of it, and I was looking for it, and during parts of the S11 and parts of the S-IVB burn, I even turned the lights down in the cockpit in hopes that I could see stars out there, but I could not make out a one. Ron, I think, maybe saw Saturn out the overhead hatch, but looking through the rendezvous window during a boost phase during a time-critical phase like a Mode 2 or Mode 4, I am very much afraid that we would not have been able to pick up that reference.

CAPCOM Roger.

SC As I remember it, as low as I had the interior lights there for a period of time, and I didn't want to keep them that low, of course, to see if I could get adapted very fast, because we were in a dynamic phase of the burn, but my window just gave me a very deep purplish hue, a hue of which I could not, literally, see through to look to see any stars at all. Now, that may have been due to the very low intensity of our interior flood lights.

CAPCOM Roger, Gene.

END OF TAPE

SC Bob, this is Jack. A little lay impression there, I think I saw just about everything Gene was talking about as far as his description and felt like it was - although everthing was an imazing experience, each one in itself, after each one was over, you could think back and say: "Yeah, that's what other guys said it was like." The old Saturn V has got to be a pretty consistently performing vehicle. But with the added night time contrast, I think it made it probably the best ride any three guys have ever had.

CAPCOM Roger.

SC Bob, I might add, that the S-1 was, as usual, pretty shakey on lift off I saw all the maneuvers as I called 'em out to yaw and the small reverse roll. Going through Max q, I got up to 25 percent, but my yaw attitude was error zero and my pitch attitude error probably wasn't even at oh, certainly less than 2 degrees. After max q she smoothed out by comparison quite a bit and the S-II was a very quiet ride, a very smooth ride. However, you are always aware, due to just a little rumbling out in the S-IVB, that she was still burning for you. The S-IVB I think was just a continually rumble, but smooth or consistent ride all the way through GLI.

CAPCOM Roger.

SC Gee! I think one of the big things that impressed me was the - how instantaneous the decelerations were of each one of the boosters when they cut off. That included the S-IV TOI cut off. No physical appreciation of tail off at all. Hey, Bob, from my rendezvous from the right hand rendezvous window when the tall jet occurred, there seemed to be a lot of burning particles streaming away from it. I could not see - did not notice - remember seeing the actual cover or tower itself, but we were inside the cone of the burn and with a lot of streaming, it looked very much like a sky rocket. Portion of one at any rate. Reminded me of the 4th of July out in Silver City a few years ago.

CAPCOM Roger

CAPCOM Say, any time you got your flight plan handy, I've got a discussion here I'd like to run through here with you now on how we're going to recover those 2 hours and 40 minutes from the launch delay and you'll need to copy it into the flight plan, and then just want you to be advised we're not happy with the PTC, we get a half angle of about 17 degrees and so sometime after the P-52 coming up in 2300 we'll want to do another PTC, or initiate PTC again.

SC Well, that was the commander who initiated PTC and I've already heard about that. You bet he has. Okay. We've got the flight plan here, Bob. Which part of it are you talking about?

CAPCOM Well, let's just talk some words here for a minute and then I'll go through some specifics you can just write down on a page cause you don't want to do it until a little later. Okay, what we're going to set up here, you will arrive at lunar orbit at the same GMT time to landing sun angle, sun elevation angle, and the camera settings and everything will be unchanged when you get to Lunar orbit. To compensate for the 2 hours 40 minute late launch we're going to tack 2 hours and 40 minutes out of the time line and we're going to, they'll be out of the TLC timeline. We're going to do it in two groups, and this is where you might want to start copying now, Ron. Delete 1 hour from 46 to 47; from 46 to 47 we're just going to delete the activities that are presently scheduled at 4630 to 4700, you'll perform at 45; move those to 45. Let me read that again. Delete 1 hour from 4600 to 4700. The activities that are listed at 4630 to 4700 perform at 4500.

SC Okay, Bob, looks like we delete 1 hour from 46 to 47 hours and then the activities that are at 4630 do those at 4500.

CAPCOM Roger, Ron, and then starting at 47, just take, just scratch 1 hour off of each time, just subtract 1 hour from each of those times up through 66 hours. Subtract 1 hour from 47 up through 66.

SC Okay, we can do that. Subtract 1 hour from 47 to 66 hours.

CAPCOM Okay, and just for your information you won't have to do it, but we're going to play the old simulator step-ahead game at 66 hours to the old time which will be 65 hours of the new time to however you want to call it, we'll call you when we're going to SINC you up at 6740 at that point.

SC We'll play the old step-ahead game there. Okay, Bob. That means that you're not going to actually do any clock updates or SINC's until somewhere in the 60's there and not in the 40's.

CAPCOM Roger, it'll be 65 hours of the new time or 66 hours of the old time, depends on how you want to look at it. But that's when we'll SINC you up.

SC Okay.

CAPCOM You'll be in SINC all the way out to that time, just, we're just going to delete and jump you to 6740. And just another note of interest, you don't have to write this down, but let's see I'll read it to you. The awake periods will be on days 3, you'll be 15 hours, 8 hours sleep starting at 11:33 CST; then at Day 4 you'll be 14 and 20 hours with 8 hours sleep. So you'd actually just shorten a couple days there.

SC Okay, mighty fine.

CAPCOM The beauty of that that Tommy came up with on that, Ron, is that all you have to do is go subtract

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those one hours and no more reading or anything else, just subtract them and we're in business.

SC Yeah, it looks real fine.

CAPCOM We're going to give Tommy a gold star for that one.

SC Ah, huh, you bet. Ah, come, this is Jack, I'm going to try and get a little exercise. I'd be interested to know how high I get my heart rate just fooling around up here.

CAPCOM Okay, if we can --- We'll keep you posted, Jack.

SC Bob, just to keep you and the people there thinking a little bit, today is a relatively short day, but it is a good day, because it gives us a chance to again get acclimated and finish our stowage and just generally go through all the things that have to be going through for the rest of the mission. We've got three eating days today, and judging from what we're thinking and talking about now, that the last two are going to be sort of stretched into one eating period because three meals on this particular day just is not going to be stomachable.

CAPCOM Roger, we understand that.

SC I think you'll find out that our eating and drinking for the most part is starting off relatively slow but I think we'll pick it up by tomorrow.

CAPCOM Roger.

END OF TAPE

SC Bob, one other thing while I'm thinking about it, the PU shifts were all noticeable, but probably the one that really caught me a little bit by surprise was the PU shift on the S-IVB during TLI.

CAPCOM Roger.

SC It just felt like you lit in the other burner.

CAPCOM Roger, understand.

CAPCOM Just for Jack's information, you're running in the 80's on your heartbeat. We saw a 91 or 2 there for a few minutes. Are you working, still working out?

SC Yes. That's sort of discouraging.

CAPCOM I'm sorry (garble).

SC Hey, Bob, what was Jack running before he started that.

CAPCOM He was running in the 60's, the count's somewhere in the mid 60's.

SC Okay.

CAPCOM Okay, Jack. You're running about 105 and 103 right now. Kind of interesting, Jack. You slowed down, then you're back up to 105 right now. Now you're slowing down again.

PAO Flight surgeon John Zeigelschmitt is watching the heart rate of Jack Schmitt, as Jack exercises aboard the spacecraft using a modified exerciser, that consists primarily of a cylinder and a cord that comes out of it allows him to adjust the amount of tension or resistance to pull that the device has, and there are a variety of ways in which it can be used, allowing him to pull against the adjustable tension. This bungee like device, and he's gotten his heart rate up somewhat in excess of 100 beats per minute.

SC Hello Houston, 17.

CAPCOM Go ahead 17.

SC Hello Houston, this is 17.

CAPCOM Roger. Go ahead. 17, Houston. Go ahead.

SC Hello Houston, this is 17.

CAPCOM Roger, 17. Go ahead. Roger, 17. Go ahead.

CAPCOM Hello 17, Houston. You read?

HONEYSUCKLE Honeysuckle Com Tech. Houston, Com Tech. Net 1. Goddard voice. Houston Com Tech Net 1.

CAPCOM Goddard voice.

HONEYSUCKLE Roger, Goddard. I'm reading you loud and clear. Honeysuckle. I'm not getting to him.

SC Hello, Houston, this is America. Over.

CAPCOM America, Houston. Stand by. If you read us, don't change anything in the cockpit yet.

HONEYSUCKLE 17, Honeysuckle.

SC Roger, Honeysuckle. I read you.

CAPCOM Hello Honeysuckle. 17's reading you loud and

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CAPCOM clear.
HONEYSUCKLE Roger. We have a comm outage. I'll be right
with you.
SC Okay. Very fine. How are things down there
today.
HONEYSUCKLE Fine. Your weather report was beautiful.
SC Oh, your country looks beautiful from here.
CAPCOM Okay, 17, Houston. How do you read now?
SC We got you, Bob.
CAPCOM That was our network problem. Not your prob-
lem on board.
SC Okay thank you. I just figured out what
happened on my PTC. Your, with his exercise, Jack, is shaking
all of America in all three axis, here.
CAPCOM Roger. He finally got to 115 on the heart
rate.
SC Yes. My rate needles are bouncing back and
forth a half a degree.
CAPCOM Roger. Got to find something to pin it on.

END OF TAPE

CAPCOM Jack surgeon over here says you've got a 120 on the heart beat for a moment there, a 122 right now. Okay 130 Jack, 130. 140 Jack 140.

PAO The numbers reported to Jack Schmitt by capcom are his heart rate and you heard him report a heart rate up to about 140 beats per minute as Jack is apparently continuing to exercise vigorously with the onboard exerciser. This is aimed among other things at keeping the cardio vascular system which tends to get lazy in zero gravity in condition.

CAPCOM Team we've got a serious one here you might be interested. All that exercise banging around in there has destratified tank 3 02 so it stirred it all up good.

SC Yes, glad we brought him along then we found some use for him. Once an EECOM always an EECOM. I have to create my own g in order to run in place.

CAPCOM Roger.

SC How high up did the heart rate get, Bob?

CAPCOM We got you at a 140, Jack. Were you running in place?

SC 140 was that - yeah, I was underneath the righthand couch holding on to the main YY strut with my hands and running against the LEB.

CAPCOM Roger, it worked real well 140 and you were running in the mid 60's so you picked up to about almost 70 beats there no problem. The surgeon is very happy.

SC Roger, well I'm happy too. It took a while to find a technique I was - initially I got up to 90 with just isometrics pushing against the couch and the running is obviously what it takes.

CAPCOM Roger.

SC But I don't - Bob I don't I really don't feel I guess I lost you.

SC Hello Houston, 17 are you still there?

CAPCOM Roger, we're with you we had a little comm problem there as you know, coming on this as we're changing on the antenna.

SC Okay, what's the heart beat right now?

CAPCOM Right at, stand by. We had a data drop out, Jack, that's why I'm holding up. And it just came on we'll tell you in a second here. About 60 Jack right about 60 even.

SC Okay, that's where I was when I started so you certainly recover fast. I don't know if that's faster than in one g or not.

CAPCOM Well, we're happy with it, or the surgeon is happy with it so it's good.

SC Well, I just how does that compare - do we have any data how that compares with the recovery - say the five minute recovery time on the ergometer.

CAPCOM We can look it up, Jack if your interested We'll have to check your records they don't have it right in front of us.

SC No big deal I was just curious.

CAPCOM Roger.

CAPCOM Jack, just for your information the surgeons pulled out the recovery rate data and the same with our data which is a little rough here it's the same zero g as your 1 g odometer data.

SC Okay, that's very interesting.

CAPCOM Roger.

SC Bob, since we've got a few moments to talk which I know we won't have later in the mission something I don't ever remember happening, but it's happening now in the windows. That's the 1, 3, and 5 but not 2 and 4 is that in the center of the window about 6 or 8 inches in diameter as you come through the night side of the rotation you pick up a very light - oh, you might call it even a frost. Very light frost on the window more like a moisture frost film of moisture or a film of frost not very thick like crystals at all as you come through the sunlight it tends to sublime away, but you never fully lose until you go back into darkness again. The very artistic definite ice crystals that we had on my number 1 window here yesterday I think we reported to you this morning that they were gone or sublimed away. But the impression they left on the window is still there very sharp and very evident.

CAPCOM Roger, we copy that.

END OF TAPE

SC Bob, I don't know whether you were copying Honeysuckle's call to us, while you lost COM there for awhile.

CAPCOM Roger. We copy.

SC But they said that they had (garble) okay.

CAPCOM They kind of concurred with your weather report there, Jack.

SC Oh, lucky guess. I might say that the sub, the zero phase point that we're looking at is right at the northeast coast of Australia and it's much brighter. It's a very bright point now, oh, it's hard to say how far across. But, quite unlike what I mentioned being in the vicinity of the Samoan Islands earlier. And it's right at the shore and it could be just that the shore area has somewhat choppy seas. So maybe, maybe the brightness of that point is a function of sea state, although I don't know exactly what type of seas it would take to brighten it up. I suspect choppy seas are better than long swells.

CAPCOM Roger, Jack.

SC That front is - seems to have slowed down its progress. It's about in the same position, possibly slightly farther north than when I started talking about it this morning. The waves seem to be developing off the - now off the southwest coast of New Zealand. It's much more pronounced than it was. Definitely seems to now have a slight cyclonic pattern - clockwise pattern. And I wouldn't be surprised if the next couple of days that moves along the front over towards Sidney. And maybe a little farther north than that might - Brubane is probably more likely.

CAPCOM Roger, Jack.

SC Now except I got the movement wrong again. Although it does seem to have progressed west from New Zealand.

CAPCOM Roger.

SC I take back what I said about forecasting Sidney's weather. I think that will - I would suspect that would move to the northeast like - now that I look it seems like an earlier front, which is partly dissipated, has the same kind of motion and now lies considerably north and east of the one I've been talking about.

CAPCOM Roger.

SC Thinking back on some weather briefings we had last week, Bob, are you there?

CAPCOM That's affirmative.

SC I'll talk to you later. I think you're - we're losing you for a little bit here.

CAPCOM Okay, Jack. We're reading you loud and clear right now. Oh, you're going out a little bit now.

SC You back with us Bob?

CAPCOM That's affirmative.

SC Okay, I'm going to try to recover there from that last few statements. As I recall, the weather briefings that we had at the Cape last week, that - talking with Ken Nabor and Jim Nicholson down there, that the patterns that we were seeing from the satellite pictures in their forecast, or analysis anyway, charts in the New Zealand part of the Pacific, those waves formed along the front would move north and then curve east. And that appears to be the pattern that was visible in one of the older fronts. And I suspect that that pattern would hold with the wave that's developed off the coast - right on the coast of New Zealand now. It might move on up the western coast of New Zealand. We'll probably have a chance to watch that in the next few days and see what happens to it.

CAPCOM Roger Jack.

SC Houston, how are you reading now?

CAPCOM Reading you loud and clear.

SC Okay, Bob. As I look at the clock, we're - just 24 hours ago we were within our hold somewhere. For this period yesterday we were in our hold, and I think it goes without saying, but we'd sure like to pass on our bit of gratitude and thanks for the response that the people down at the Cape came up with. And particularly at Marshall. I think we all knew no one would be going anywhere unless everyone was satisfied that we were going all the way, and that's certainly the way we felt, but we do want to thank everybody there for making that come true.

CAPCOM Roger, Gene. I think it was a superb show between the Cape and Marshall and Houston and probably with Goddard with the network and just about everybody concerned, really. Had to do some work there to bring it off. And it went off real smoothly.

SC Yeah. After flying with Stafford a couple of times and having that happen a few times back, I thought maybe he was aboard.

CAPCOM (Chuckle) Okay. I think that was a first for getting a Saturn V to 30 seconds before ignition and - or rather actually 30 seconds before liftoff and holding there.

SC It got mighty quiet on board about 30 seconds.

CAPCOM I sure imagine.

SC We all felt like old hands the second time around, though.

CAPCOM Roger.

SC Bob, I've been at that 30 second count one other time and it's no different the second time around.

CAPCOM Roger.

SC But we do appreciate the work and I think it's typical of - of what made this manned space program such a super program. The response of people like that.

CAPCOM We concur with that Gene, wholeheartedly

END OF TAPE

SC And with that in mind tell everyone to stick around because there's a lot left to be done.

CAPCOM You had better believe it.

SC The old accumulator cycle again, I guess, gang.

CAPCOM Roger, we're seeing it. It looks like you have master alarm. Is that affirm?

SC Yes sir, that's how we've (garble). Although it doesn't happen all the time and I guess as long as whenever we have that waste vent closed, we probably wouldn't be bothered by it at night.

CAPCOM Roger, that's - that's our feelings here, Jack. Say, Gene and Ron, I talked to your fraus on the phone here a little while ago and they gave me a very interesting observation you might appreciate. They were standing close to some water when launch when they noticed that when the booster lit up there was something scared all the fish because the water literally began to boil with fish jumping from the light, I guess, or from the shockwave or something. It must have made a very distinct impression because that's the first thing both of them told me about.

SC Yeah, that's pretty neat.

CAPCOM A neat way to go scare up the fish, I guess.

SC Right. How are they doing today, Bob?

CAPCOM Really fine. Really fine. They're just like I said. However, they're tickled pink and Barbara said that she wants you to know she's going into quarantine until after the weekend here, until after the landing.

SC If she goes into quarantine, that'll be a space first.

CAPCOM Roger. You got to be careful about all this.

SC You know what to tell them - go ahead, Bob.

CAPCOM You got to be careful now - the hotboxes are open - the hotlines are open at the houses there so everything you say is being listened to.

SC Yeah, okay, in that case, just want to say hello and we're having a super good time looking forward to what's coming, and we thank you for the news Robert.

CAPCOM Roger.

SC And my impression of the World philosophically, I suppose you'll be getting from time to time, but it sure hasn't changed.

CAPCOM Roger, Gene.

SC It's sure beautiful. It's sure beautiful and, looking back at it, there's several billion people who have got a lot to work for because it's one of the most beautiful sights we've ever seen here.

CAPCOM Roger, Gene. You guys are sounding

great and doing real great. You're pressing right along here.

SC I just want to emphasize, Bob, that these first two days - of course, yesterday was a pretty good day, but today we're catching up and, as I say, on the food consumption, don't be expecting too much.

CAPCOM Roger.

SC Acclimation and familiarity, stowage and preparation, and enjoyment and relaxation - are ready to call it a day today which is probably the most ideal day in the flight plan to put it because it's probably the only one we'll have.

CAPCOM Roger.

SC Not that they aren't all going to be enjoyable. Hey, Bob, your hourly weather report is due and I'll wait awhile. I keep losing your COMM.

CAPCOM Okay.

SC Bob, are you there?

CAPCOM Roger, Jack, we're standing by.

SC Okay, I had a quick look and just to bring you up to date, we're starting to be able to see the coast of Asia. The Phillipines are wide open today and the that tropical storm Theresa, I mentioned I thought I could see - indeed I'm sure that's what that little concentrated mass of clouds was north of New Guinea. And I suspect, although I didn't get a good fix on it, that the folks in Guam may be in for some heavy weather.

CAPCOM Roger.

SC Oh, and Bob, I got another pair of pictures and that would be up to 134.

CAPCOM Roger, that's on November, November, is that affirm?

SC That's affirm.

CAPCOM (garble).

SC And that was taken the last pass about 10 minutes ago if you want to keep track of GET.

CAPCOM Roger, thanks, Jack, I'm doing that. Here's some information for Ron, in particular. We've evaluated the data from the mapping camera and pan camera cycling there and it looks real good. Everything looks right normal.

SC Hey, that's outstanding good deal.

END OF TAPE

SC Bob, how do you read 17?
CAPCOM 17, read you 5 by.
SC That's strangest sounding Bob I've ever heard.
CAPCOM He's taking a short break.
SC Okay. Good. Nice to talk with you.
Hey, I don't know whether you were Gene the other day when talking about the circulation patterns around Antarctica. We were looking then at the Indian Ocean, or actually the south Atlantic in the Indian Ocean region, and you see the same pattern at about the same latitudes, say 60 degree south, where all the linear cloud patterns which presumably are - reflect the various cold fronts have - are arcuate with their convex sides, or actually almost pointed sides - are all lined up in a west-east direction around that latitude. It's quite a spectacular appearing circulation pattern and the little wave that I mentioned on New Zealand seems to be - beginning to form another arrow or another convex point on that front that's fitting right into the same circulation pattern.
CAPCOM Okay, copy.
SC That would make four of those major convex fronts that I can see from this view crossing south of Australia up into the South Pacific.
CAPCOM Okay.
SC On that tropical storm that was Teresa, I don't know if they're still calling it now - that now, but I'm not sure it may be a little south of Guam. Guam may not be in trouble with that one.
SC It looks like its just a bit to the west of Manila there about 5 or 6 degrees no more than that though. It looks like it's about 5 degrees west of Manila and about 5 degrees south. And it is still called Teresa.
SC Okay, Gene, if you're still there, I don't like to argue with you but I think our analysis chart is a little more up to date.
CAPCOM Okay.
SC That area that you just mentioned is very clear now. East of the Philippines. Did you say west or east of the Philippines?
CAPCOM West of the Philippines.
SC Okay, that area that you mentioned, 5 degrees east is very clear and the center of teh - the - what appears to be the storm that I'm speaking of would be about 142 longitude and may be 8 degrees north latitude.
CAPCOM Okay.
SC Which would put it south of Guam.
CAPCOM Okay, Yeah, you're over in the area between Guam and the Carolines, then.
SC Say again, Gene?
CAPCOM You're over in the area between Guam and the Carolines, then. You're saying it would be just about due west of the Carolines, then.

SC Yes, sir.

CAPCOM Okay.

SC Yeah, you're probably looking at a - oh, I don't know - maybe a what - a 12 hour old prog, or something?

CAPCOM Yeah, that's the one I had for launch day.

SC Okay, well its moved quite a bit now, and I guess its the same storm, still seems to be very well organized but quite concentrated and small.

CAPCOM Okay, I'll get a new prog in and compare your estimate, there.

SC Okay, I think that's pretty good - those 142 and 8 degrees would be pretty good center of that storm. That's a pretty good - I can see Mindanao and I can see the - let's see - just a second - what is that on Australia? Yeah, of course, that is Port Moresby. I can see that point there and it's between those two - I can pin that one down probably within a couple of degrees.

CAPCOM Okay. We'll get a satellite photo and bring it in here in just a bit.

PAO The conversation over the past few minutes has been between Flight Director, Gene Kranz, and Jack Schmitt. Apollo 17 at this time, almost directly above the northeast coast of Australia - some 94 000 nautical miles from earth.

END OF TAPE

SC Ah, Houston, caster number 4 is in
Bravo now.

CAPCOM Roger, we copy that.
SC Houston, 17.
CAPCOM Go ahead 17.
SC Okay, Bob, that storm off the - just
off the southwest coast of New Zealand is still intensifying
and has both high and low level clouds you can see by
shadow lines. It looks like it may go into pretty fair
storm system. Borneo is very clear today and the Phillipines,
as I mentioned, it looks like a very strong frontal system
that stretches from, oh, let's say the south coast of,
southeast coast of Viet Nam up between the Phillipines and
tawan and across tawan and right along and I can't tell, I
think just off - just south of Japan, I can't tell whether
Japan is in the front or not, I'll look at it some more.
The strongest storm center that I can see on that is way
north and probably Hokkaido has a fair amount of weather
from that storm system. There seems to be a tropical
depression just north of Borneo, very strong circulation
system north of Borneo and I guess just south of Viet Nam.

CAPCOM Roger.
SC Probably southeast. I hadn't noticed
it before, but it is extremely concentrated northern
hemisphere cyclone pattern. I don't know whether that's
on your prog or not. That's not what's left of Sally is
it?

CAPCOM Standby, let me look at the prog over
here, Jack Okay, we - it doesn't show on the old one, the new
one is coming in here shortly, Jack.
SC Okay, if that is a developing depression
it's approaching Luzon and not very far away - 2 or 3 degrees
of longitude now, but Luzon is clear.

CAPCOM Roger.
SC I can see Korea quite well, Bob. It's
clear today.

CAPCOM Yeah, we've got the fronts, the leading of
the front on our prog was past Korea and on Japan and you've
got it moving quiet a bit further east there.
SC Well, I'm not absolutely sure - master
alarm on the accumulator -

CAPCOM Roger, we copy.
SC I can't make out Japan specifically yet,
but it's clearly past Korea and by inspection it looks like
it would be also past Japan by now, the trailing edge of the front.
However, the circulation center on further northeast maybe
effecting the Hokkaido, as I said.

CAPCOM Roger. Like I said, the front on the
old prog for yesterday showed that front on the other side
of Japan, so it moved across pretty well.

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SC As I recall they had a tropical storm called Sally that went into (garble) a few days ago and so I suspect this new one that I think I see between Borneo and Viet Nam maybe something else, a new depression or I may be fooled by it. Mainland China, Bob, was - on the last pass here, I can't see the Earth now, but mainland China looked like it was clear as far as I could see but there might be another front quiet a ways inland, but that gets right at the LM and I can't tell, but Korea, Yellow Sea and the regions of China, south of there, Shanghai, Nan King and those places look as though they are quiet clear today. I'll check that again next time around.

CAPCOM Roger. And, Jack, we are ready to terminate the charge on battery B and start the charge on battery A.

SC Okay, that should work.

END OF TAPE

SC Houston, for your information, system test 7A is about .6.

CAPCOM Say that again, Jack, sounds like I heard a .6 on system test 7A?

SC That's affirm, battery compartment pressure.

CAPCOM Thank you Jack.

SC Okay, Bob, battery A is being charged now.

CAPCOM Roger, Jack.

SC Bob, have you got any of the LMies in there today?

CAPCOM Any of your LMies. Roger, they're all sitting by. Just gave me a big thumbs up, Jack.

SC Okay, give them a thumbs up on the rendezvous radar antenna. It looks real good.

CAPCOM Roger.

SC I'm nose to nose with it practically here at about 2 feet and it's extremely clean and I see absolutely no sign of anything abnormal with it.

CAPCOM Roger.

SC Matter of fact, compared to some of the flaking problems and things like that we heard about in the past, I never saw a cleaner piece of hardware than that LM looks right now.

CAPCOM Roger.

SC Appropriately, finally, we're getting - we're starting to use it during the Christmas season. It sure looks like a Christmas package with all the orange tape on it.

CAPCOM Roger. Ron, we've got your NOUN 05

SC Okay, I'll go ahead and accept that one this time.

CAPCOM We got the 9 degrees, Ron, and you can torque.

SC Okay, I'll torque it to the 9 foot.

CAPCOM Okay, we got it. And, Jack, we've been looking at our records. We don't have a previous system test reading for 7 Alpha. Do you recall of any previous reading?

SC Yeah, that looks like another accumulator cycle - had our master alarm.

CAPCOM We dropped data just then, Jack, so we can't concur or confirm it.

CAPCOM That was exactly the right time (garble).

SC Bob, you cut out about your system test meter discussion.

CAPCOM Roger, Jack. Do you have any previous 7 Alpha readings? We don't have any in our log here written. We're just wondering what the past reading from that was.

SC No, I think that was the first one we would have been called to make after a battery charge, right?

CAPCOM That's affirm, Jack.
CAPCOM Go ahead, Jack, you're coming in very weak.
SC Well, I didn't intend to be transmitting.
We were just discussing the battery vent and things. We may have missed something in the dump checklist. We'll check it out.
CAPCOM Roger, we don't think so. We just thought maybe you might have read it earlier.
SC Oh, yeah, you want the battery vent it should be closed now, right?
CAPCOM Okay, stand by, Jack.
SC Okay, Ron says it ought to be open.
CAPCOM That's affirm. It should be open.
SC Let me just check -
CAPCOM There's no question about that. It should be open.
SC Okay, it's open.
CAPCOM There's no problem, Jack. It should be open but the value appears a bit low to us and we'd like to read it again before you go to sleep or we may want to close it. And the nominal reading would be 1.7 on that.
SC (garble)
SC Okay, we closed it when we were doing all our dumping some time back and neglected to open it again. So, it was closed when I gave you the reading and it has been closed during some 2 hours anyway. I haven't figured out how long.
CAPCOM Okay, we copy that. Jack, would you mind opening the vent and watching the system meter concurrently with it?
SC Stand by. Well, it's closed now and it's still reading what it - .6. Do you want us to open it again?
CAPCOM Rog. Open the vent and -
SC I mean, it's open now. I'm sorry, Bob. It is now open and reading .6. It read .6 when it was closed.
CAPCOM Okay, just leave it open now.
SC Okay.
CAPCOM And we'll want to still check it prior to your sleep period.
SC Okay. Okay, Bob, a little update on the coast of Asia. It looks like some residual cloudiness would be affecting the Pusan region of Korea. And, also, that's residual after the frontal passage. And it looks like maybe Shanghai, after all, may have some storms associated with it but it's really hard to pick out exactly - the exact coast line of Asia, but I - there are some clouds in the Yellow Sea behind the front. Look like they might be possibly some high cirrus is all.
CAPCOM Jack, do you still see that storm that you said was sitting between Guam and Borneo and that area?

SC Okay, Houston. We're moving in the pieces of the pre-sleep checklist. Here's one more readout for you. Battery C is 37.0; Pyro Bat A is 37.2; Pyro Bat B is 37.2; RCS A 95; Bravo 94; Charlie 94; Delta is 96.

CAPCOM Roger, we copy that. And if you started - we don't want you to reinitialize the PTC until about 2400 on the ' timeline.

SC Okay. We're - we're just getting a little ahead - we - took us longer last night on the pre-sleep than we expected. We're trying to work it out again.

CAPCOM Yeah. We don't to - we want to terminate the waste stowage vent at that time, because we think that that vent is what's contributing to our PTC.

SC Okay. We're - we're not - we're not really ready to go to sleep yet, but we're just moving ahead.

CAPCOM Roger.

SC And if it's okay, I'll cycle the H2 fans.

CAPCOM Roger. We're standing by.

SC Okay, the fans are off.

CAPCOM Roger.

PAO This is Apollo Control at 23 hours 25 minutes.

The crew has completed realigning the inertial measurement platform- the platform used as a stable reference. The spacecraft guidance and control system uses it as a reference in determining its own attitude. They've also been charging the two entry batteries that are used during peak electrical loads of liftoff, and then are recharged during the translunar coast when the fuel cells are producing a surplus of electrical energy. They recharged one of those two batteries and are in the process of recharging the second one at this time. And you heard the crew describe going into their pre-sleep checklist and getting things aboard the spacecraft configured for the sleep period, which is scheduled to begin at 25 hours ground elapsed time or a little more than 1-1/2 hours from now. Apollo 17 at this time is 96 244 nautical miles from Earth, traveling at 5 264 feet per second. And all spacecraft systems continue to function almost perfectly as planned. A little while ago the lunar module officer - control officer - confirmed from telemetry what Gene Cernan was reporting visually out the window and that is that the lunar module appears to be in very good shape. Of course we have a limited number of telemetry readings on the LM at this point. But one of them that we do have gives us an indication of the integrity or tightness of the LM cabins. We can see that in the amount of pressure decaying. It appears to be a very tight vehicle.

CAPCOM Say, Jack, we got a request in here from our ARIA friends.

SC Go ahead.

CAPCOM They were just wondering if your looking out that way, if you could give them some sort of update of what the weather in the Wake Island-Kwajalein - the south of the Wake area look like.

SC Okay. Let me work on that one.

CAPCOM Okay. You're going to earn your American meteorological society badge pretty quick.

SC Okay. Let me get the monocular and we'll look at Wake Island. I miss having all those nice latitude-longitude lines on the globe.

CAPCOM Yes sir.

PAO The ARIA friends that CAPCOM, Robert Overmile, is refering to, are the crews of the Apollo Range Instrumented Aircraft used in supplementing the manned spaceflight network coverage. They'll be leaving from Patrick Airforce Base prior to the end of the mission and flying into the Wake Island area to be on station during Apollo 17's reentry and splashdown.

SC Okay, Bob, I'll probably have to work on this one a little more, but - but it looks like around Wake, or in the vicinity of the Kwajalein's and north of Wake, about all you have is a lot of cloudiness although - and in a generally - over wide part of that Pacific, I'm talking about 15 or 20 degrees of longitude and latitude, there's a - roughly a clock a - clockwise circulation pattern, but the clouds do not look very dense or concentrated in any one area. And leading off to the southeast from that general cloud mass there cyclonic - anticyclonic cloud mass is a - is one of the old fronts - or at least one of the old linear cloud patterns that extends down into the south Pacific.

CAPCOM Roger, Jack. I'm sure that the ARIA troupes are listening down at Patrick and got all of that.

SC Well my guess is, Bob, and it's purely a guess, is that there probably - if they were out there right now, would be experiencing an intermediate layer of clouds with scattered showers. And a not too strongly developed circulation system, so I can't predict the winds. But I wouldn't expect them to be anything - anything what might be down - associated with the remnants of the tropical depression Thresa. Now that Thresa - what's left of it, if I'm correct in picking it out there, probably is moving in that direction, although it looks weak enough that right now I don't think it would be any big problem. It may, in fact, go south of there.

CAPCOM Roger. The prog I got in my hand for three hour old weather has Thresa located just about in the Manila area. Did you concur with that or do you think it passed the Philippines?

SC Well, I don't - Manila's clear. The only thing approaching near Manila is this other storm center that is now north of Borneo. And to the east of Manila it's clear all the way over to this little cloud mass that I was guessing that might be Thresa.

CAPCOM Roger. All I say, this is 3 hours old -

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SC That's about - I gave Gene Kranz the coordinates on it. You can look it up. Those are pretty good coordinates for that cloud mass. Now whether that's really Thresa or not I don't know.

CAPCOM We got one thing with - for the last couple of hours here, we've been getting high bit rate data through our new facility - a new facility at Tidbinbilla. Tidbinbilla is through a 210 dish and they're covering the first -

SC Wake in the Kwajalein - Marshall Islands, in that area, and it doesn't look like a very concentrated weather pattern, although it looks like you'll have ceilings in that region, and they're overcast ceilings rather than broken. Except around the fringes of it.

CAPCOM Roger.

SC We'll keep an eye on it of course.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/7/72 CST 23:12 GET 23:37 MC 139/1

CAPCOM Jack, how do you read us now?
SC You're on clear.
CAPCOM Okay, 17, for the last 2 hours we've
been getting high bit rate data from a new facility, the
facility at Kid Ben Villa and they working their first
Apollo flight ever, you might give them a cheery hello.
SC Kid Ben Villa, is that correct?
CAPCOM That's affirmative. It's very close
to the Honeysuckle Base -
SC Where is that.
CAPCOM Very close to Honeysuckle.
SC Well, how you doing, how you doing
mights? We certainly appreciate you guys being on the
loop for this one.
PAO That new 210 foot dish antenna at Kid
Ben Villa, which is near Honeysuckle Creek, which in turn
is near Canberra, now on line and accounting for our
excellent signal strikes on the spacecraft. Apollo 17 at
this time is 96 958 nautical miles from Earth. The speed is
5 233 feet per second.
CAPCOM 17, Houston, we'd like ACCEPT and will
update your gyro drift, the pitch roll and yaw drifts.
SC Okay, got ACCEPT IN POO.
CAPCOM Roger.

END OF TAPE

CAPCOM 17, Houston. The computer is yours - and you can go back to attitude and reinitialize PTC whenever you want to.

SC Go ahead, Bob.

CAPCOM The computer is yours. Gene.

SC Go ahead, we're reading you.

CAPCOM Go to attitude and reinitialize PTC whenever you want to .

SC Okay. Did you mean to leave the computer with verb 21901 on.

CAPCOM Roger, that's your computer with - as you got it.

SC Okay, that's right. That's 1462. Okay.

CAPCOM 17, Houston.

SC Roger, go ahead.

CAPCOM Rog. We've got a recommended configuration for your H2 fans and H2 heaters. We would like the H2 heaters 1 and 2 to auto and H2 fans 1 and 2 off, 3 to auto. Your O2 heaters look good.

SC Okay. Let me verify that I've got these right. H2 heaters 1, 2 auto. O2 heaters, 1 off 2 off 3 auto. H2 fans - H2 fans you want off, off, and auto. Is that correct?

CAPCOM That's what we want on the H2 fans and the O2 is fine. You've got it.

SC Okay, they're off, off - Okay, H2 fans are off, off and auto.

CAPCOM That's affirmative, Jack.

SC Okay, Bob. I just cleaned the SID circuit return valve screen, here. It was probably, as expected, a little crud on it. A few things have collected but they're really not too bad.

CAPCOM Roger, Gene.

SC Bob, a little more about Wake and the Marshalls and Kwajalein. That large pattern of - would appear to be broken to overcast clouds in a clockwise circulation pattern - crosses the equator region now that I've tried to project that through.

CAPCOM Roger, Jack.

CAPCOM 17, Houston.

SC 17, go ahead.

CAPCOM Roger, Ron. When you stop the present roll on the PTC to reinitialize, pick a roll angle of 315 or 130 for stopping so that we have good comm during the damping period.

SC Okay. 315 or 120, okay?

CAPCOM 130, Ron.

SC Okay. 315 or 130.

CAPCOM Roger, that will give us good comm to watch the data on the damping.

SC Okay.

PAO This is Apollo Control, now 24 hours after liftoff and Apollo 17, 97 917 nautical miles from earth.

The crew, at the present time, is stopping the passive thermal control mode. They'll be reestablishing it. It had begun to diverge a little bit - it had begun to wobble about the axis. The concern in going to sleep with that sort of situation is that it will wobble through the point at which they would have gimbal lock and of course we would wake them up before then but in order to avoid having to disturb the crew's sleep they'd like to get the passive thermal control very stable, so that it will hold up during the entire sleep period.

SC How do you read?

CAPCOM Read you loud and clear, 17.

SC Okay, we're at 300, do you want us to go to 315 yet or is 300 going to be okay?

CAPCOM That's good enough, Gene, and we'd like you to close your waste vent at this time, please.

SC Okay, its closed now.

CAPCOM Roger.

And 17, Houston. We've got the same recommendation. We recommend Alpha and Bravo for damping, Bravo and Delta for spinup. Over.

SC Okay, Alpha and Bravo for damping and Bravo and Delta for spinup.

CAPCOM That's affirmative.

CAPCOM 17, Houston. If one of you want to break out the flight plan supplement, we have a change to the E-loads on page 143 due to the change of gyro-compensation parameters if you want to copy them down when you get something off.

SC Okay, we'll give you a call.

CAPCOM Roger, we'll be standing by.

SC Okay, Bob, we're on our damping cycle now.

CAPCOM Roger, we're watching you, Gene.

PAO This is Apollo Control. We're in the midst of turning over the shift now to Mission Control, to the team of Flight Director, Pete Frank. Gene Kranz and his team will be going off shift in about 25 minutes. We do not plan to have a change of shift Press Briefing. The crew aboard Apollo 17 is scheduled to begin an 8 hour sleep period in a little less than one hour at a ground elapsed time of 25 hours. And we have no major activities in the flight plan before that time. At 24 hours 9 minutes, this is Apollo Control, Houston.

END OF TAPE

SC Houston, 17, Okay if we close the waste
stowage vent now?
CAPCOM Oh, okay, I'm sorry, it's closed.
APO Roger, 17.
SC Forget it, we got it. I was left out.
CAPCOM Okay, Bob, on the film status, we are
still where we were, November - November 134 and I'll probably
take 2 more pictures before I go to sleep.
CAPCOM Roger, we copy.
CAPCOM And, 17, if one of you are down in the
LEB could you give us a readout on system test 7 ALPHA.
SC Stand by. Okay, Houston, 17, 7 ALPHA
is point 6.
CAPCOM Roger, 7 ALPHA equals point 6.
SC Okay, Houston, 17, are we configured
properly now for COMM?
CAPCOM Stand by, Jack.
SC Okay, I'm on OMNI bravo right now.
CAPCOM We're in good shape on the Comm and
we'll be controlling the OMNI.
SC Roger, Bob.
CAPCOM 17 the rates look great, we're ready to
initial PTC.
SC Okay, Bob.
SC Okay, Bob, PTC is initiated.
CAPCOM Roger, Gene, we copy and we watch the
roll start.
SC Hello, Houston, I think we've got every
thing done on the checklist, the water has been chlorinated,
we're in PTC and I think Jack picked up every thing else.
How does it look to you?
CAPCOM Roger, Gene, let us make our check through
the room here and just a reminder that I've got that addition on
the E loads for the flight plan supplements.
SC Stand by, Jack's gonna keep the headset
on and the biomed and he'll close you out with that and if
there're nothing else I'm going to go off the air.
CAPCOM Roger, Gene.
SC Okay, say goodnight to my friends back
there.
CAPCOM We certainly will.
SC Hey, just so that we know, it is about
midnight, right?
CAPCOM It's about 7 minutes after midnight.
SC Okay, Just wanted to make sure it wasn't
noon.
CAPCOM Roger.
SC Goodnight there, Robert.
CAPCOM Goodnight, Gene.
SC Okay, say goodnight Dick.

PAO This is Apollo Control at 24 hours 36 minutes as Gene Cernan says goodnight Apollo 17 is 99 714 nautical miles from Earth. Velocity 5114 feet per second. The Lunar Module Pilot, Jack Schmitt, will be wearing the communications headset and the biomedical harness for the sleep period tonight.

SC Bob, Jack, your last report for the day as the Earth goes past window 5. The first thing I noticed was that our zero face point is not nearly as bright on the west coast of Australia as it was on the east and it's looking right at the coast line now and see no bright spot in the center. Also that circulation pattern or tropical depression possibly that I saw earlier north of Borneo is now even more strongly developed and the tail end of the front is searching up toward Japan and it, it really looks like a humdinger from here. Beautiful circulation pattern and very concentrated. And it is now east of Viet Nam and again between Viet Nam and the Island of Luzon.

CAPCOM Roger, we copy.

SC And I'd be very curious to know tomorrow morning if you people are carrying that one on their progs or on their analysis chart.

CAPCOM Roger.

SC Okay, Bob, you want me to erase something on page 1-43 and insert something else.

CAPCOM That's affirmative, Jack. On 143 under column A down at line 11 and 12 and 13, just to make sure you have the right spot the line 11 0 data is 00115, you copy that, do you see that?

SC I'm with you.

CAPCOM Okay, change that line to 00377.

SC Go ahead.

CAPCOM Change line 12 to 00050.

SC Go ahead.

CAPCOM 005 -

END OF TAPE

CAPCOM 050 -
SC Go ahead.
CAPCOM And line 13, 00523. Over.
SC Okay, got that and, as you might imagine,
when I said erase, I did. And you have the 04 and the 05 again
please. That is, if they're pertinent.
CAPCOM Stand by, Jack, I'm lost here myself for a
second.
SC We gave you a update on 30704 and 31005 and
I just erased it.
CAPCOM Okay, the 04 under column B is 34761 and
the 05 line under column B is 15403.
SC Okay, and here we go. In line Alpha,
3141100377, 3151200050, 3161300523. In line Bravo, 30704 is
34761; 31005 is 15403. Over.
CAPCOM Roger, we copy, Jack. Just a reminder to
be sure and configure the COMM per the presleep checklist and
just for your information, Jack, I hold you at 100 116 miles.
I was going to give you a call at a 100 000 even then I got
talking to you so you crossed the 100 000 mark right now.
CAPCOM Tomorrow you're probably not going to be giving
us our weather report - you'll be too far out but we'll probably
be starting to hear from the Moon, huh?
SC We're not going to see much of the Moon,
you know. It's going to be pretty dark so I'll have to keep
looking at the Earth.
CAPCOM Roger.
SC Pretty good - pretty interesting place.
Very interesting place.
CAPCOM I'm real sure.
SC And I guess maybe I - 100 000 miles - my
goodness gracious. That's impressive.
CAPCOM Yes sir. You're slowing down all the
way, Jack.
SC Yeah, it's sure downhill all the way back,
isn't it?
CAPCOM That's for sure. Jack, did the CMP get off
the line and is he sacked out too.
SC Yeah, I lost both those guys. They decided
they wanted to sleep and I may be rumbling around here for awhile
but I took - we all three took Seconols so I think we'll get to
sleep before long.
CAPCOM Roger. Just give us a call if you need
anything and we'll be watching everything and pleasant dreams.
SC Now you don't really mean that, do you?
CAPCOM Well, I can't come up and tuck you in so -
Hope you have a good sleep, you need lots of rest up there, gang.
SC I'll tell you, Bob, about half way through

APOLLO 17 MISSION COMMENTARY 12/8/72 GET 24:42 CST 0016 MC 142/2

this day I think I acclimated and I really feel good. I've been eating a lot better and I'm not - the only thing I ever really felt was a slight headache. It really - not the fullness of the head that people describe, I guess, but just a little headache. I could have been looking at the Earth too much, I don't know.

CAPCOM Roger, Jack, you've been sounding good.

SC Oh, actually, I've been feeling fine. Just - none of us have felt like eating and that's probably normal and everybody's eating more now and we'll start to sleep at night.

CAPCOM Roger. Jack, just a reminder on that time for the presleep checklist. It's important to us because we can get high bit rate data more.

SC Bob, we cut out right in the comm sleep configuration now - working that way.

CAPCOM Okay. Ed Grindell was shaking his head one minute - now says as long as you're working that way.

END OF TAPE

SC Bob, you're still cutting out. Try it again.

CAPCOM No - no problems, Jack. Just a reminder on the COMM, that's all. We're watching you go through the checklist here.

SC Okay. I'm on high gain now and OMNI Bravo selected. How do you read, Bob, on the high gain?

CAPCOM Read you loud and clear, Jack.

SC Okay. And it's in REACQ 10 zero.

CAPCOM Stand by. Stand by on that, Jack.

Okay, Jack, can we refer you to the checklist on S1-27, a sleep configuration there where your S-band squelch enabled, etc.

SC Roger, I'm enabled. Oh, etcetera, yes.

CAPCOM Roger.

SC Okay, I'll get you that in a minute, Bob.

Who knows, I might have something else to say.

CAPCOM Okay.

SC Bob, I just probably ought to qualify all those remarks about the Earth's weather. It's purely a novice talking about something he is very unfamiliar with, except for having a longstanding interest in it, and I think the one philosophical point, if any, that comes out of it is that somebody, probably three and a half billion years ago or so, could have looked at the Earth and described patterns not too dissimilar. And, it was within those patterns that life developed, and now you see, I think, and obvious to everybody, what that life has progressed to doing, and I certainly think that all of us feel it has not stopped doing that progression, and we'll probably see it doing things that even you and I can't imagine them doing. I certainly hope so.

CAPCOM Roger, Jack, we concur.

SC Bob, you always wish that you had a poet aboard one of these missions so he could describe things that we're seeing and looking at and feeling in terms that might - might transmit at least a part of that feeling to everybody in the World. Unfortunately, that's not the case, but he - he certainly couldn't look at that fragile blue globe and not think about the ancient sails of life that are crossing its path and wonder ahead to the - up to the present, to the modern sails of life that are represented by men that developed out of that life that are sitting there next to you and that are

the country in all sorts of different guises and working towards the same end and that is to put that life farther into the Universe. I certainly hope that some day in the not too distant future, the guy can fly who can express these things.

CAPCOM Roger, Jack, you're doing a pretty good job expressing them. Jack, Houston.

SC Go ahead.

CAPCOM Alright, Jack, we'd like to go to select OMNI Bravo and stow the high gain in the normal stowage. It is customary we do not use the high gain for PTC going TLC.

SC Okay, Bob, I'm sorry but the checklist indicated that you do all go back to OMNI Bravo.

CAPCOM Rog. It's probably ambiguous if you end up going on the checklist up to the top of 128, it shows you where you want OMNI Bravo.

SC Ambiguous is the best word I can think of for it.

CAPCOM Say again, Jack.

SC Ambiguous is the best word I can think of for it.

CAPCOM Rog, I concur. I should have probably called you earlier and just pointed out on the flight plan where it says presleep checklist and then there's the word COMM and it says OMNI and that leads you into the checklist and makes sure you use the OMNI setup for the sleep configuration.

SC Ho, ho, ho. Tricky fellows. I guess you're right.

CAPCOM Yes, normally we don't SIM PTCs, TLCs, and TECs very often, that's for sure.

SC Well, that's because we have a whole day to learn out here.

CAPCOM That's affirmative.

SC OMNI Bravo.

CAPCOM Roger.

PAO This is Apollo Control. It's 25 hours 1 minute into the mission. Apollo 17 is 100 953 nautical miles from Earth. Velocity 5 062 feet per second.

END OF TAPE

PAO This is Apollo Control at 25 hours 22 minutes. We haven't heard from Jack Schmitt recently, however, the Flight Surgeon reports that his data indicates that he is not yet asleep. Apollo 17 now at 102 000 miles from Earth velocity 5018 feet per second. We'll continue to leave this line up until we get an indication that the Lunar Module Pilot is asleep. The other 2 crewmen are asleep. At 25 hours 23 minutes, this is Mission Control, Houston.

SC Okay, Bob. I think I'll hit the hay.
How does everything look to you?

CAPCOM Looking pretty good, Jack.

SC Yeah, I'll get that - just want to be sure that PTC and everything looks good. Okay, I'll talk to you in the morning, - or to somebody anyway.

CAPCOM Roger. Parker will wake you up - I think. Have a good sleep.

PAO This is Apollo Control at 25 hours 27 minutes. Jack Schmitt has said "goodnight". We'll take the line down now and come back up with Mission Control reports hourly. Apollo 17 now 102 202 nautical miles from Earth, velocity 5010 feet per second.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/8/72 CST 0200 GET 26:27 MC 145/1

PAO This is Apollo Control at 26 hours 27 minutes. The crew has completed the first hour and 1/2 of an 8 hour rest period. Here in mission control, flight controllers are monitoring spacecraft's systems while the crew sleeps. All goes well with Apollo 17. Spacecraft is 105 060 nautical miles from Earth. It's velocity is 4893 feet per second. This is Mission Control, Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/8/72 0301 CST 2727 GET MC 146/1

PAO This is Apollo Control at 27 hours 27 minutes. 5 1/2 hours remain in the crews rest period. All spacecraft systems continue to operate normally. Apollo 17 is now 107 835 nautical miles from Earth, velocity 4784 feet per second.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/8/72 CST 5:00 GET 29:27 MC 148/1

PAO This is Apollo Control at 29 hours 27 minutes.
Apollo 17 is 113 208 nautical miles from Earth. Traveling at a
speed at 4579 feet per second. In 36 minutes, Apollo 17 will
reach the half-way point to the Moon in terms of distance, at a
ground elapsed time of 30 hours 3 minutes no seconds. Apollo 17
will be 114 787 nautical miles from both the Moon and the Earth.
3 hours 32 minutes remaining in the crew's sleep period. At
29 hours 27 minutes, this is mission control Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/8/72 GET 30:27 CST 0600 MC 149/1

PAO This is Apollo Control at 30 hours 27 minutes. 24 minutes ago Apollo 17 did reach the half-way point in distance in its journey to the Moon. At that time in the elapsed time of 30 hours 3 minutes, it was 114 787 nautical miles from both the Earth and the Moon. Its velocity at that time was 4 522 feet per second. At this time, Apollo 17's distance is 115 842 nautical miles from the earth. Velocity is 4 483 feet per second. Midcourse correction number 2 will be performed at an elapsed time of 35 hours 30 minutes. That's 5 hours 1 minute from now. It will be a 10.5 foot per second burn. The crew still has 2 hours and 31 minutes remaining in the sleep period. At 30 hours 28 minutes this is Mission Control Houston.

END OF TAPE

PAO This is Apollo Control at 31 hours 12 minutes. Apollo 17 is now 117 746 nautical miles from Earth, traveling at a speed of 4415 feet per second. Flight Director, Pete Frank, and his orange team of flight controllers will hand over Mission Control duties to Jerry Griffin's gold team of flight controllers in about 15 minutes at 7 A.M. central standard time. Each of the departing controllers is now briefing his relief. There will be no change of shift news conference. The orange team will double back after 1 shift, returning to the Control Center at 5 P.M. today to get back on a schedule which will put them on the EVA shift. To summarize the shift now ending, the crew began rest period at 25 hours elapsed time. Each crewman took a sleeping pill and Jack Schmitt reported that Gene Cernan and Ron Evans were asleep shortly after the crew configured the spacecraft for their rest period. However, Jack Schmitt, who was the duty man to wear the head set and the bio-medical harness during this rest period, seemed almost reluctant to surrender his view of the earth to sleep. At 100 000 nautical miles from the Earth he broadcast a weather forecast, then indulged in a bit of philosophy as he gazed from his window, about mankind's achievements. He remarked that from his vantage point the Earth probably looks the same now as it did at the dawn of man. Apollo 17 reached the halfway point to the Moon at an elapsed time of 30 hours 3 minutes. At that time it was 114 787 nautical miles from both the Earth and the Moon. Spacecraft's systems are continuing to perform well and the CAPCOM astronaut Bob Parker plans to awaken the crew at 33 hours elapsed time, that's 1 hour 44 minutes from now. Midcourse correction number 2 will be performed at an elapsed time of 35 hours 30 minutes, 4 hours and 14 minutes from now. Present indications are that it will be a 10 and 1/2 foot per second burn. The latest prediction on the S-IVB is that it will impact the Moon at an elapsed time of 86 hours 58 minutes 23 seconds. Coordinates of the impact location presently predict it 6.73 degrees south, 9.7 degrees west. The impact time and the coordinates are likely to change prior to the impact itself and continued tracking of the S-IVB will be performed. At 31 hours 16 minutes, this is Mission Control, Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY, 12/8/72, CST 08:00, GET 32:27, MC-151/1

PAO This is Apollo Control at 32 hours 27 minutes ground elapsed time. The Mission of Apollo 17, which at this moment is 120 887 nautical miles out from Earth, velocity has continued to decrease to 4305 feet per second. Slightly over a half hour remaining until spacecraft communicator Robert Parker gives the crew a wakeup call. And a relatively busy day ahead with midcourse correction, - midcourse correction maneuver #2 at 35:30 ground elapsed time, a 10-1/2-foot per second posigrade maneuver which will raise the trajectory slightly from an impact trajectory with a minus pericynthion at the Moon, raise it to about 60 nautical miles above the surface. Latest numbers on the S-IVB impact predictions is for impact to take place at the ground elapsed time of 865823 at 6.7 degrees south latitude by 9.7 degrees west longitude. The gold team of flight controllers have settled in for a 10-hour day here in Mission Control, which in addition to the midcourse correction burn, includes the first manning of the lunar module, first checkout, which begins at about 40 hours. They start actually, at 39:30 getting the probe and drogue removed from the tunnel, going into the lunar module. We'll come back up live with the air-ground when the first call is made to the crew by the spacecraft communicator. And at 32:29, this is Apollo Control.

END OF TAPE

PAO This is Apollo Control, 32 hours 58 minutes ground elapsed time into the Mission of Apollo 17. Almost 2 minutes remaining until the first wakeup call is made to the Crew of Apollo 17 by spacecraft communicator Robert Parker. Parker is joined this morning by Apollo 17 backup Commander John Young at the CAPCOM console, and it appears that Parker's relief CAPCOM Gordo Fullerton, just walked in the door and likely will relieve Parker in the day's duties of getting off midcourse correction #2 burn and the first housekeeping venture into the lunar module. Apollo 17 is now 122 186 nautical miles out from the Earth, velocity now 4259 feet per second. We'll stand by with the circuit open for the first wakeup call the usual post-sleep checklist, and flight plan updates and all of the conversation that normally takes place when the crew first wakes up. Let's just open the line now.

CAPCOM Apollo 17, Houston. Good morning.

SC Is that the best you can do?

CAPCOM That's not very good either. Give us a call when you want to talk to us.

SC Good morning to you.

SC How's everything look, Bob?

CAPCOM You guys look absolutely super, there's no problem at all.

SC Nice way to wakeup. Maybe we'll get to sleep in for a few more hours.

CAPCOM Standby. I'll check on that.

SC (Laughter)

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/8/72 08:40 CST 33:08 GET MC153/1

SC Bob, 17 how do you read?
CAPCOM 17, this is Gordo, Bob just finished up
his work day with that last call, and I'll be on now.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/8/72 09:00 CST 33:28 GET MC154/1

SC Houston, 17. How do you read?

CAPCOM Loud and clear, Jack.

SC Good morning Gordy. How are you doing?

CAPCOM Real good. How about you?

SC We all feel pretty good this morning.

Got some reports for you.

CAPCOM Okay. Ready to copy.

SC Okay, on this CDR; PRD is 17025. 6 1/2 hours good sleep. One seconal, which is the one I reported last night. So that's just one now. I had a - yesterday, mid-day or so - he had a nausea pill for gas. And we hadn't found the other gas pill so he tried that one and he drank, since I last reported, two and a half containers of water.

CAPCOM Roger.

SC CDR food intake, as with all of us, is a little bit random and I don't know exactly the best way to report it unless you want it all in detail.

CAPCOM Let me check while you - go on and I'll see if they want a detailed description of his food or not.

SC Okay, LMP medical. PRD 24036. 5 1/2 to 6 hours good sleep one intermittant. Again I had a seconal but that's the same seconal I mentioned last night. And since last report - I guess 1 and - 2 and a half containers of fluid. (Garble)

CAPCOM Okay.

SC And just for checking on the water intake, you should have me down for 6 containers of water.

CAPCOM Roger. 6 total.

SC That's affirmed.

SC CMP Medical. PRD is 15023. 7 1/2 hours very good sleep. He had the same seconal we had and since last report has 3 water containers for a total of 6 now.

CAPCOM Roger.

SC Jack, I guess we do want an accounting of all the food. Whatever you think is the best way to report it.

SC Okay, Gordy. Back on the CDR and I'll just tell you what we ate. For the day 2. CDR mixed fruit at the can, instant breakfast, one vitamin pill; a bag of tea; Turkey and gravy; the wet pack; and orange juice.

CAPCOM Roger.

SC Okay the LMP. Cinnamon toast bread, mixed fruit, instant breakfast, coffee, lemonade, peach ambrosia, 1 vitamin, 1 slice of bread, grapefruit drink, gingerbread, orange drink, and I have one complaint. Somebody slighted me on a carmel candy and in meal C.

APOLLO 17 MISSION COMMENTARY 12/8/72 09:00 CST 33:28 GET MC154/2

CAPCOM Rog.

CAPCOM We'll stand an investigation.

SC Yes, it was not there.

SC Okay, CMP. The spiced oat cereal, mixed fruit, instant breakfast, and coffee, potato soup and peach ambrosia. That's all for breakfast. And then later on he had chocolate pudding and a grape drink. And let's see - we are - you might log him for a vitamin pill and me for a vitamin pill.

CAPCOM Okay.

SC Oh, yes, I forgot. It's here, 1 frankfurter for lunch.

CAPCOM Roger.

SC And we just changed LiOH canister as for the flight -

END OF TAPE

SC - in the LiOH cannister as per the Flight Plan.

CAPCOM Okay.

SC And in a minute I'll have the weather report for you.

CAPCOM Very well.

SC Gordon.

CAPCOM Go ahead.

SC Gordy, the null bias check plus .9 and 100 seconds.

CAPCOM Okay, one question that G&C had, do you do that null bias at plus 100 or minus 100 on the MS scanner?

SC Plus 100.

CAPCOM Okay, and then it increased up to 101.9, right?

SC No, it increased to 100.9.

CAPCOM Roger, miscopied you .9 okay, thank you.

SC Yeah - okay.

SC Seems to me like last night it was 100.7.

CAPCOM Roger.

CAPCOM And for our part of the post-sleep checklist, I have the consumable status, if you'd care to listen.

SC Stand by, Gordy.

SC Gordy, we'll take your consumables in a second, let me bring you up to date on the weather around the world, if you're interested.

CAPCOM Yes we are, go ahead.

SC Africa, looks in pretty good shape, there is a- except for an area probably around Zambia and Rhodesia in the tropical convergence zone there where it looks pretty cloudy and probably quite rainy. There's a very strong circulation pattern and presumably a storm just off the coast of northwest Africa, very spectacular spiral formation of clouds in a cyclone development. It looks like there are probably 2 fairly weak cyclones - southern hemisphere cyclones in the south Atlantic. One, southwest of the Cape of Good Hope and the other about due west of the Balkan Islands, maybe a little bit north of that. South America looks to be in quite good shape weather-wise, except possibly Uruguay and maybe northern Argentina which appear to have a - at least some fairly thick clouds there, although no strong circulation associated with this. (Noisy interference covers some transmission).

END OF TAPE

CAPCOM Okay, Jack. We got all that up to Argentina, then the OMNI switch kind of cut you off.

CAPCOM Jack, we got at least the first part of your weather report from up through the clouds in Argentina and then the switch in OMNI's cut you out.

SC Okay, that was about it, Gordie, that's - talk to you some more later on it. I guess the main thing I need now are your consummables.

CAPCOM Okay, by the way, you were looking back from more than half way to the moon, you're about 125 000 out now. On the consummables, the RCS is running at 1.3 per cent over the flight plan line. On the O2, tanks 2 and 3 are right on the line and tank 1 is about 4 per cent below the line, but it's been there all the way since launch, that same bias on tank 1. On the hydrogen, tanks 1 and 3 are right on the line, tank 2 is about 3 percent above the line. All in all, you're looking real good consummable-wise.

SC Okay, that's hardly worth writing down I guess. That's the way we like to see it.

CAPCOM Same here.

CAPCOM The only other thing I have in the way of updates is a PIPA bias update. You can load it yourself or we can load it when we come up with the uplink prior to the burn - your choice, and then we'll have an update to the erasable load update and a supplement to correspond with that bias update.

SC Gordie, why don't you go ahead and load it yourself when you send up the vector.

CAPCOM Okay, and I'll give you the update for the supplement. It's on 1-43 whenever it's convenient.

SC Okay, Jacks getting that out. I ran another PIPA bias at minus 100 and it confirmed the first one. It ended up at 99.2.

CAPCOM Roger.

SC Go ahead with your update on 1-43, Gordie.

CAPCOM Okay, it's in the load A, and the octal ID of 03, which now reads 77252, change that to 77655.

SC Did you copy, Gordie?

CAPCOM I didn't copy your readback, no.

SC Okay, 30603 and alpha 77655.

CAPCOM That's right.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/8/72 CST 09:30 GET 33:59 MC-157/1

SC Gordy, how do you read?

CAPCOM Loud and clear.

SC Okay, for the reference on those figures, at least for the LMP, I think I'm probably putting 8 or 9 ounces of water in the citrus drinks and those kind of things rather than 7, which has probably upped my water intake some.

CAPCOM Okay -

SC I think that probably goes for everybody. That probably goes - goes for Ron and probably Gene also.

CAPCOM Roger.

END OF TAPE

CAPCOM 17, Houston, I have a little synopsis of the news here if you'd like to listen during breakfast, let me know.

SC Okay, mighty fine. Send it up.

CAPCOM Okay, front page first. In Paris Henry Kissinger met for 30 minutes this morning with French President Georges Pompidou at the Elysee Palace just hours before his scheduled conference with North Vietnamese Polit Bureau member Le Duc Tho. North Vietnamese spokesman accused Kissinger of attempting to force a peace settlement by threatening further escalation of the war. As both U.S. and North Vietnamese negotiators expressed disappointment at the continued deadlock, Chief American delegate William J. Porter traveled to Brussels to brief Secretary of State William B. Rogers. Rogers will return later today from the NATO Conference of Ministers. This one is datelined Brussels. Diplomatic sources indicated today that NATO allies will request negotiation with the Soviet Union and its allies on mutual troop reductions in central Europe. Exploratory talks is expected to begin by January 31, with full scale negotiations to follow sometime next fall. In Kansas City, vital life signs for Harry S. Truman appeared to have stabilized. But the 88 year old former President remains on the critical list at Kansas City's Research Hospital. Truman is suffering from lung congestion and heart weakness. In Argentina, aids to popular Argentina politician Juan Peron said that Peron will refuse the nomination to the presidency of Argentina, and will return to exile during the coming week. And on the sports page, Rice coach Al Conover is expected to reveal sometime today his decision to either remain at Rice as head coach or move to his alma mater Wake Forest in a similar position. The Owl head coach has said that he has been offered the job and promises a "yes" or "no" decision today. There is some speculation that head coach Joe Paterno of Penn State may move to a head coaching job in the Pros next year. Paterno is busy preparing his Nittnay Lions for a Sugar Bowl meeting with Oklahoma and is refusing to discuss the matter until after the game. Locally, the state high school football playouts -

SC (garble)

CAPCOM Say again?

CAPCOM Okay, 17, continuing after being rudely interrupted by the omni switch, the state high school football playoffs here in Texas are underway and with a whole host of games scheduled this weekend. And the final item, the major league baseball players association and the commissioners office are going at it again. It must be getting close to spring training time.

APOLLO 17 MISSION COMMENTARY 12/8/72 09:40 CST 34:09 GET MC158/2

SC Gordie, you cut out at just the Nittnay Lions.
CAPCOM Okay. Did you hear about the high school
playoffs?

SC No, the last we heard was the Nittnay
Lions.

CAPCOM Okay, Paterno, the head coach at Penn State
may move to a head coaching job in the Pros next year. He's busy
setting up his Nittnay Lions for a Sugar Bowl meeting with Okla-
homa, and is refusing to discuss the matter until after the game.
Here locally, the state high school football players are - play-
offs are underway with a whole host of games scheduled for this
weekend. And the final item of the major league baseball associa-
tion, and the commissioners office are going at it again, which
means it must be getting close to time for spring training.

SC No editorials, please.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/8/72 CST 10:10 GET 34:39 MC-160/1

CAPCOM Apollo 17 it's your computer you have a State
Vector, VERB 66, a target load and a PIPA bias update.
SC Very good.

END OF TAPE

SC Believe it or not, Gordy, I'm ready for your pad.

CAPCOM Okay, Jack, it's a midcourse 2 SPS/G&N. The weight is 66786 plus 121 minus 013; mission time is 035:29 59 09 minus 00034 plus 00021 minus 00098; attitude is 132 194 343; HA and HP are NA LVT 00106; burn time is 002 00065; sextant star is 25 2337 164; rest of the pad is Na. LH none. Other remark . LM weight 36281. High-gain angles pitch minus 21 Yaw 181. And this will give you a perilune of 53.1. Should make everybody on board feel a little more comfortable. Over.

SC Okay, Gordy, we haven't particularly uncomfortable but knowing no way we would hit the moon here's MCC2. SPS/G&N 66786 plus 121 minus 013 035:29 59 09 minus 00034 plus 00021 and you cut out on Delta VZ. Give me that again, please.

CAPCOM Okay, Delta VZ is a minus 00098.

SC Okay, Delta VZ minus 00098 132 194 343. NOUN 44 is NA 00106 002 00065 25 2337 164. Rest of pad is NA. No LH. LM weight 36281. High-gain pitch minus 21 yaw 181 perilune 53.1.

CAPCOM Okay, that's a good readback.

CAPCOM 17, Houston. You can go back to block now.

SC Okay. We're on block.

CAPCOM Jack, a couple of quick items. We would like for you to terminate the battery A charge now and also turn the H2 tank heaters for tanks 1 and 2 off.

SC Okay. H2 tank heaters 1 and 2 are OFF and I'll terminate the charge.

CAPCOM Roger.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/8/72 CST 10:30 GET 34:50 MC-162/1

PAO This is Apollo Control 34 hours, 58 minutes ground elapsed time. Apollo 17 spacecraft, should at this time be coming out of the passive thermal-control mode and getting into the proper attitude for the midcourse correction burn #2, which is some 31 minutes and 23 seconds from now. Apollo 17 presently 126 988 miles from the Earth traveling at velocity of 4098 feet per second. The midcourse correction burn #2 with an ignition time 35:29:59.1 has a velocity change in the posigrade direction of 10.6 feet per second, which for the service propulsion system engine is a BURP lasting 1.58 seconds. Purpose of this burn is to raise the pericyynthion from an impact trajectory as it stands now, to one with a clearance over the Moon of some 53 nautical miles which will become the pericynthion of Lunar Orbit. Standing by on air-ground 1 at 34:59 this is Apollo Control.

SC Okay, Gordo, there's all balls and 05 on that P52.

CAPCOM Roger that looks great - -.

SC And, you're looking at NOUN a 93. Okay, you're looking at NOUN 93.

CAPCOM Okay, you have a go to target.

SC Houston, Apollo 17. We're in the Delta-V test route reading minus 22.2 and having a little trouble finding the SPS cue card wonder if FAO will know exactly where that is?

CAPCOM Stand by I'll check.

SC Houston, if you saw a master alarm, it was the power SE normal switch getting hooked to OFF.

CAPCOM Roger.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/8/72 CST 10:40 GET 35:09 163/1

CAPCOM As far as we know the SCS burn card ought to be in with the rest of the cards in R2.

SC Gordie, we finally found that thing. It was way back in the back, sorry.

CAPCOM Okay.

SC We're starting our pressures, Houston.

CAPCOM Roger.

SC Okay, Houston. We'll get to the attitude in about another 4 minutes or so. We'll do the P30 and go right into P40. We're doing a waste water dump, urine dump and man, the sky is just full of tiny little particles.

CAPCOM Roger, Ron.

SC Hey, I doubt if we can get the star selection check, but we can try it.

END OF TAPE

SC Okay, 35:29:59:09 for the time 981.
Okay 981 (garble).
SC Just burn time's good.
SC Okay (garble).
SC Okay got the DET started. - -
CAPCOM Jack, you can bring us to high-gain anytime
now.
SC In 10 minutes, Jack's in good shape. Okay, got
that. (garble)
SC He's dumping waste water in about 15 minutes.
SC Yeah.
SC Yeah, straight up to release, Jack.
CAPCOM And, Jack, also we showing 10 percent on
waste water now.
SC 786 LM weight.
SC Okay, PC OFF (garble) OFF. (garble)
SC Do what?
SC 13, okay, here we go.
SC (garble) okay realign the old GEC a little
bit.
SC Okay GEC is aligned. Start control breakers.
SC All in and good shape.
SC (garble) rig command tidbit memory to load.
SC Yeah.
SC Okay, TVC is in RATE COMMAND LM CSM
is in LM CSM. Gimbal drive is in auto. Okay.
CAPCOM Jack this is Houston, we're ready for the
high gain.
SC (Laughter).
CAPCOM 17, Houston. Do you read?
SC I think there's no trim on this front end.
SC Okay.
CAPCOM Apollo 17, Houston. How do you copy?
SC Okay, that's (garble).
SC Okay (garble) 2 feet per second.
SC Yeah, we're down to 6 minutes.
CAPCOM Apollo 17, Houston. How do you read?
SC Okay Gordo, we got you.
CAPCOM Okay, we weren't getting through there for
a minute or two. We're ready for the High-gain now.
SC Okay. Minus (garble) 21 and 181.
CAPCOM All right 17, you're Go for midcourse 2.
SC Okay, sounds good.
SC Jack you ready for Gimbal motors. Ready for
the Buss ties?
SC Ready for the Buss ties.
SC Okay, tape recorder high bit rate record
forward, command reset.

APOLLO 17 MISSION COMMENTARY 12/8/72 CST 10:50 GET 35:19 MC-164/2

SC Check your helium valves and check your N2.
SC Servo power 1 and 2 we got.
SC Okay, got zero power.
SC AC 1 AC2.
SC AC (garble) off. B MAGS 1/2.
SC Okay.
SC No hard overs okay. We'll go to SPS.
SC Okay Pitch 1, Jack. Mark it.
SC You're on 1.
SC Mark it.
SC Okay, got a minus 1.1, okay.
SC Minus 1.3 is almost zero.
SC Okay, whoo, Man, (garble)
SC Bounces around (laughter).
SC This is a little different from - -
SC Okay, we'll give it to the computer.
SC Clockwise. Go back to Vic. Okay, Pitch 2
Mark it. Got it.
SC You're on 2.
SC Mark it.
SC Got it.
SC Okay, got to trim plus 12 and minus .1. Vic
to Vic, Vic to Vic. Okay, give it to the computer turns to 0. No
VIC to Vic.
SC Okay
SC CDC, directs are Main A and Main B KouV mags.
SC Okay.5018 proceed.
SC That true?
SC Okay. Uncage B mags.
SC Okay, let's try our Gimbal test. Plus 2,
Minus 2, 0, plus 2, minus 2, 0. Okay she went to trim. - -

END OF TAPE

SC 238 to go. Okay, we read you.
Scale was 51. Okay, Rate I. Okay, M is normal at 1 minute.
Yes, we use bank A.
SC Three second burn. We use bank A. Over.
SC Okay, so 3 seconds is there. Okay,
cycle to (garble) right to high, direct to CMC AUTO uncaged
RET command gimbal motors LM CSM and (garble).
SC Okay, Houston. 130 and we're going on
board for the burn.
CAPCOM Roger.
SC Okay. No ullage.
SC Houston, I'm sure you've seen it. We're
reading below the green Band oxidizing pressure. About
163.
CAPCOM Roger.
SC Okay, lets wait until 30 seconds.
SC Control power is on. (garble) Get it
and EMS in 30 seconds. Ullage - no ullage.
SC For an average, G.
SC Okay, average G is covered EMS to
normal. Delta V thrust stay is on. Okay, no manual to it.
You get the 99. Okay?
SC 10 seconds, Houston.
Capcom Roger.
SC 99. Uh Hoo! There we go. Okay -
SC The burn is on time and auto shut down.
CAPCOM Roger.
SC Okay, see what kind of trim we got.
Yes, we trimmed it. Trimmed it two tenths. Yes. Plus 7 on
the EMS.
CAPCOM Roger.
SC I mean on the R1. (laughter).
SC Okay, we'll trim our attitudes. It's
plus three tenths. What margins? Okay, there we go.
SC Okay, Houston, you're looking at 985
and the EMS is minus 3.3.
CAPCOM Roger, Gene.
SC Okay, gimbal motors check. 2 - mark it,
2 - mark it, 1 - mark it, 1 - mark it. Okay, servo power
is off; trans control power and directs are off; ullage
circuit breakers are open. Hey, we just caught up with all
the particles. They're all on our windows, now. The directs
are off John. (garble) opened. Okay, you got the Delta V
counter? Okay, V max are caged. BUSS ties, Jack? Okay, BUSS
ties are OFF. Get RAD to low while you're up there. They
shouldn't change, I don't think. Okay.

APOLLO 17 MISSION COMMENTARY 12/8/72 11:00 CST 35:29 GET 165/2

SC Houston, America.

CAPCOM Go ahead.

SC Okay, the burn was on time. Looked like it was about 2 seconds. (garble) GX was .7. Roll was 132. Pitch was 193. And yaw was 342. Residuals after trim were plus 0.1 0 and minus 0.1 and Delta VC is minus 3.3. Oxygen 007. Fuel is 009 and decrease 50.

CAPCOM Roger.

SC Metcure was off. Metcure was off, huh?

SC Yes, its (garble) coming off (garble)

SC You know, Houston, we must have caught up with every one of those particles. Because we're right in the middle of them. They're going kind of in a random fashion. Most of them are drifting right along with us. Some of them are going against us and away from us. But before we did the burn - you know the perpulsion they got out of the vent. Sent them all away from us in what looked like, in more or less, the x-direction.

CAPCOM How about that.

SC Say, we've really got a star field out there now.

CAPCOM Rog.

SC Say, Gordy, the LM's CM Delta P is 1 - that's 1.0. Do you want me to go to tunnel vent?

CAPCOM Stand by.

CAPCOM Yes, that's affirmative, Gene. You have a GO for tunnel vent valve vent.

SC Okay.

END OF TAPE

CAPCOM 17, Houston.
SC Houston. Go ahead.
CAPCOM Okay, we do want to put battery A back on charge as shown in the Flight Plan. And also, I have a new slide by pad. No hurry on this one, but it's a fly by pad post and CC2.
SC Okay, Gordo, how quickly should this tunnel vent?
CAPCOM Let me get a reading on that.
CAPCOM Geno, that should take about an hour. We'll try to remember to occasionally remind you to look at it.
SC Okay, I'm glad you said that because I don't see any indication of it moving here yet at all.
CAPCOM Rog.
SC Houston, 17.
CAPCOM Go ahead.
SC Never got to give you a seven alpha reading after the last charge. It was a .6 as before.
CAPCOM Okay, and Ed Mitchell must be working now. I was just about to ask you for that. And for Geno, one reminder, you will have to switch back to the LM/CM Delta P in order to read the Delta P. Over.
SC Yes, Gordo, I'm aware of that, and I've done it, but in the about 3 or 4 minutes that I vented I didn't see any change yet.
CAPCOM Okay, it's a pretty slow process.
SC Okay, Gordie, battery A is being charged.
CAPCOM Roger, Jack.
SC And I checked that seven alpha in the vent position and it's .6 also.
CAPCOM Okay.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/8/72 CST 11:20 GET 35:49 167/1

SC Okay, Houston. How's the CMP's (garble)
ZPN?

CAPCOM Let me take a check to my left here.

SC I'll take a deep breath for you.

CAPCOM Okay, Ron. Your ZPN looks good.

SC Okay, I don't have the other one on yet,
but was a little bit curious because I left the electrodes
in this thing, and - you know the little sponges, I left
those inside the electrodes, but they stuck to the back of
the electrodes and kind of corroded the inside of it a little
bit.

CAPCOM Evidently it's working okay.

SC Okay, mighty fine.

SC Put some new ones in.

END OF TAPE

APOLLO 16 MISSION COMMENTARY 12/8/72 CST 11:30 GET 35:57 168/1

(Dead Air)

APOLLO 17 MISSION COMMENTARY 12/8/72 11:40 CST 36:09 GET MC169/1

SC Okay, Houston, is my heart beating?
CAPCOM I'm sure it is, Ron, but I'll check to my left.
SC Okay.
CAPCOM We'll wait a couple of minutes, it takes that
long to settle down and give you a reading on it.
SC Okay. No problem.
CAPCOM Ron, your EKG looks real good.
SC Okay. Thank you much.
SC That's all new, we call it those punches
and stuff, you know.
SC And, Houston, I'm not putting any cover tape
on it, so if it quits - you know, comes loose or something like
that, well let me know and I'll push it on again.
CAPCOM Okay, will do.
SC You might make a note that Dr. Evans was
assisted in that operation by Dr. Schmitt.
CAPCOM Roger, doctor.
CAPCOM Jack, I've still got this flyby pad standing
by.
SC Nag, nag, nag.
SC Can't talk with a mouthful of bread cubes,
it all comes out.
SC Okay, what kind of pad you want to give me?
Flyby, right?
CAPCOM Right. A regular maneuver pad.
SC Okay, and I guess the other one I can cross
out, right?
CAPCOM That's something that's obsolete now that
you've done micourse 2.
SC Okay, Gordie, I'm all set.
CAPCOM Okay, it's a flyby SPS/G&N: 66678 plus 121
minus 013. Ignition time is 081144349 plus 00433 plus 02118
plus 04532. Attitude is 128 146 317. HA is N/A. HP is plus 00211.
Delta V T is 05021. Burn time, 118 04976. Sextant star is 251893
274. Boresight star is N/A, NOUN 61, is a plus 1560 minus
17500 11016 36242. GET at 05 G is 1532403. GDC stars are Sirius
and Rigel 256 152069. Ullage, none. In MARKS 1, burn docked; and
number 2, a seventh PTC REFSMMAT. And that's it. Over.
SC Okay, Gordie, here is your readback. Flyby
SPS/G&N: 66678 plus 121 minus 013 081144349 plus 00433 plus 02118
plus 04532 128 146 317. HA is N/A plus 00211 05021 118 04976,
251893 274. Boresight, N/A plus 1560 minus 17500 11016 36242
1532403. Sirius and Rigel, 256 152 069. There is no ullage.
For MARK 1, burn docked; and 2, PC - PTC REFSMMAT is assumed.
CAPCOM Okay, that's a good readback.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/8/72 CST 11:50 GET 36:19 170/1

SC Gordie, I might mention for future reference, that we've established a new list of consummables, or at least add it to the old one. That includes gray tape and tissues.

CAPCOM Okay, you want us to track those?

SC It might help. We have a heck of a time finding them in here.

CAPCOM Roger.

SC Oh, you meant quantitywise.

CAPCOM No, we're all set up in a special back room.

SC We could call it the TT room - tissue and tape of course.

CAPCOM Roger.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/8/72 CST 12:00 GET 36:20 MC-171/1

PAO This is Apollo Control at 36 hours, 34 minutes ground elapsed time. Apollo 17, 137 714 nautical miles out from Earth, velocity now, 3985 feet per second, continuing to decelerate as we approach the so-called cross over between the sphere of influence from Earth to Moon. I can't recall ever seeing two pages of a flight plan as blank as these are, from 36 hours to 38 hours. Later on today, the, - after the eat-period the crew will crawl through the hatch into the Lunar Module for housekeeping chores checking out of stowage of equipment in the Lunar Module. But, the most exciting thing going on now, was the checkout of Bio-medical harness on the Command Module Pilot. Midcourse correction burn went nominally on time. The velocity just at time of ignition was 4058 feet per second. It jumped approximately 10 feet since there was a 10-foot per second burn. But then, within a few minutes it was down below the original velocity as the spacecraft continues to decelerate. Altitude at the time of the burn or distance from Earth was 128 217. We show a pericyynthion of 52.09 miles at closest approach after the burn. And standing by at 36:36, this is Apollo Control.

CAPCOM Apollo 17, Houston. In about an hour or you might check the LM Command Module Delta-P again.

SC Thank you, we'll do that.

SC It's 2.2 Gordo, I put it back in vent.

CAPCOM Okay.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/8/72 12:30 CST 36:59 GET MC172/1

SC Hello Houston, America.
CAPCOM Roger, America. Go ahead.
SC Okay, Gordo. We're up to 2.5 on the
tunnel and still venting.
SC Okay, is that music we hear in the
back ground.
SC Yes sir. (music) They've been making
fun of some of my music.
CAPCOM Hey, it's coming down good, better
than stereo.
SC Reminiscent of yester year. (music).
SC Music from America.
CAPCOM Roger. Thank you for the concert. That's
very appropriate.
SC Gordo. Ron went off the air for a
minute and LM Delta P is now 2.6.
CAPCOM Okay Gene.
CAPCOM Gene-o, we would like for you to let it
get up to 2.8 before closing off the vent.
SC Okay, Gordo, we'll make it 2.8.
CAPCOM Roger.
CAPCOM America, Houston. That was a slight
handover, the reason we lost signal for a second, there.
SC Okay.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/8/72 CST 13:00 GET 37:28 MC-173/1

SC Houston, 17.
CAPCOM Go ahead.
SC We're going to have a pretty good view of
the Earth out of any CSM windows at the LM checkout altitude?
CAPCOM I'll check on that.
SC We're sort of blocked right now.
CAPCOM Roger.
CAPCOM America, Houston, we're predicting that your
LM CM Delta-P ought to be about right now, about 2.8.
SC Okay.
CAPCOM We would like a reading - -
SC We'll check it.
SC Gordo, 2.9.
CAPCOM Okay. Sounds good.
SC Gordy, the reason I asked about that view
of the earth, we were sort of thinking maybe we might go early
if it was all right with you, and watch the Earth a little bit
more.
CAPCOM Okay. We're still trying to get the answer
on whether you have a window, standby, I might have it here.
CAPCOM America, Houston.
SC Go ahead.
CAPCOM Okay, the (garble) LM inspection attitude that
you'll go to results in kindly a marginal view of the earth out of
window 1, about 60 degrees away from it, boresite line of site. And
we're- - we can - we've started to work on it and if you want to do
it you can go to kind of intermediate attitude, which will be the LM
attitude except for roll which will be off by about 60 degrees, which
we'll give you a good view of the Earth out of window 1 and then
when we get ready to do the LM entry, you can roll additional 60
degrees to get to the proper attitude. If you wish, your choice,
over.
SC Yeah, if that doesn't bother anybody down
there we'd like to do that.
CAPCOM Okay. We'll have something for you here in
a few minutes.
CAPCOM Okay, if you're ready to copy of a VERB 49
maneuver for you, that will let you look at the Earth.
SC Wait a minute Gordo, I'll just let you load it
as we go here.
CAPCOM All right.
SC Okay, ready to copy.
CAPCOM Okay. Roll at 240, Pitch is 089, and Yaw 0.
And the high-gain for that attitude, we think it'll probably track
to this attitude, is plus 29 and 27.
SC Okay. Plus 29 and 27.
CAPCOM Roger.

END OF TAPE

CAPCOM America, Houston until you get the attitude
OMNI Charlie will probably work better.

SC Okay, Gordy, we got your OMNI Charlie
now.

CAPCOM Okay, Locked on.

SC Gordy, for your information we have our
LM transfer items in the jettison bag ready to go over and we're
pretty well squared away on the, all the command module stowage
now with minor exceptions.

CAPCOM Okay.

CAPCOM America, Houston we'd like you to go ahead
and get on the high gain again since, stop it just wondering
around aimlessly, and how does the Earth look now?

SC Sorry, Gordy to be so slow, Earth looks great !
and we'll get the high gain up.

CAPCOM Okay.

SC Houston, 17, are you reading?

CAPCOM Go ahead, loud and clear.

SC Okay, Gordy, going from South to North
on Noon time, at least our Noon time weather, looks like there
is a fairly strong mass of polar air moving from the Southwest up
towards Tierra Del Fuego. It's mixed with some cloudiness that
extends from that area all the way down to the Antarctic ice
shelf. But looks like some pretty good movement patterns from the
southwest north northeast. No strong weather waves or cyclone
development on that yet although one may be picking up about
half way between Tierra Del Fuego and the coast of Antarctica.
The - where the front, or at least the cloud masses curve from
an east west direction to an almost due south direction.
Most of South America still looks like pretty good weather.
There is cloudiness along the Andian Ridge and also in the
Amazon Basin, stretching from the eastern coast of South
America on up about, oh, two-thirds the way towards Central
America. It doesn't look like frontal weather there. It's
probably tropical convergence weather. Now there is this -
still this small moderately developed cyclone pattern that's hanging
pretty much over Buenos Aires now, I think, Uruguay and
Buenos Aires. I think I mentioned that earlier in the day,
and that still is there and I suspect those folks are getting
a fair amount of weather out of it.

CAPCOM Roger.

SC Except for scattered clouds, Central
America and Mexico for the most part are clear. As is most
of the Caribbean Islands. Cuba and the others all look like
they have pretty good weather. There's a little clouds off
- cloud pattern off to the east of those Islands but doesn't
look like any major weather in that area. The eastern half
and midwest of the United States is completely cloud covered
by now. There, however, the - extending from Mexico to Senora

and up into Arizona and New Mexico and possibly as far north as Colorado, is a clear band; but then there is more cloudiness to the north of that. The Pacific regions west of - the west coast of the United States is cloudy at least west of Southern California. I can not see Baja, so that cloudiness extends down south of - into Baja, California. I see no strong new frontal patterns; although I'm looking right across the LM at the Earth now. There may be one that would be lying maybe across Northern California and into Colorado. With a little clear area ahead of it, possibly in Kansas, but then into this solid bank of clouds that stretches from Brownsville at least clear up to - along the Gulf Coast across the panhandle of Florida, up the East Coast into, on out Nova Scotia, I'm sure. Florida is clear. Florida, let's see, the peninsula portion of Florida, it looks very clear and some of the deep turquoise green water to the south and southeast of that area are very obvious at this time.

END OF TAPE

CAPCOM Roger, Jack. I'm following along on the satellite weather picture here that's taken from about your same vantage point, and although nowhere near the detail that you're describing.

SC Have you seen today's analysis charts of the United States or North America?

CAPCOM No I haven't. I just told Jack that the weathermen and a lot of other people around here, too, are following your weather reports with great interest.

SC Yes. Does that mean they're right or wrong?

CAPCOM You've got the better view by far.

SC That doesn't prove much. Okay, Gordy, I'm, I suspect that that's a pretty healthy front. I don't know. Your weather must be cloudy and bad today. Is that right?

CAPCOM Yes. We've got about a half mile vis and drizzly rain.

SC Okay. Well, I suspect comparable weather extends all the way across the eastern United States. That looks like awful dense clouds, although there's no obvious frontal pattern. It just stretches from the Midwest to the East Coast. And, also, there's no good indication of stratification of those clouds, as if they'd be fairly thick up into the serious level.

CAPCOM Roger, Jack.

SC Looks like Arizona, New Mexico, and northern Sonora probably has 1 band of high cirrus, but other than that, probably a beautiful day out in that area. There's some transverse cloud patterns over the Mississippi/Alabama area. Suggest maybe that the jet stream may be just north of that region. But otherwise, there's now good indication of jet stream position right now.

CAPCOM Rog.

SC Gordy, there is one minor weather disturbance, possibly just about over Puerto Rico or maybe just to the east of that island. No strong circulation patterns, although there's a hint of a cyclone development. Might be just a small depression in that area. I don't know whether your maps carrying anything down there or not.

CAPCOM I think I see what you're talking about on the satellite picture, but I don't have a service analysis that goes that far. I do, just now, got a copy of the services chart for the United States. And there's a front stretching from northern Texas northeastward up through Tennessee and Virginia, and another one sort of parallel to it. But, this way southward from Louisiana along the Gulf Coast across northern Florida and on out into the Atlantic, and I guess the two are kind of blending together to make that irregular mass of clouds you mentioned.

SC Okay, Gordy, if I'd been a little more observant I could see that there was a little bit, looks like a decrease in at least the thickness of the clouds, vertical thickness, between the

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SC two areas you just mentioned. So, there is some indication of those two fronts. Although, they are contributing to a general weather pattern in the eastern United States.

CAPCOM Rog.

SC I think with a little experience in this business, you might have picked those two out of that mass, but it's not immediately obvious.

CAPCOM Roger.

SC You got anything on there coming in from the northwest now, say up in Wyoming or Colorado?

CAPCOM The way it's drawn on this surface charts shows that northern front that I mentioned just now, sort of curving on up through Central Colorado, and then bending westward toward, through Utah. That's about the only other frontal activity. There's one, probably dry front, then a short one through Central Arizona. And southern Utah.

SC Okay, well that makes sense. That would match with that what I was thinking was high cirrus in Arizona. And also I can see how you could bend, that's the northern front up through Colorado and then back westward to explain the patterns we're seeing in the clear areas south of that.

CAPCOM Rog.

SC Gordy, the zero phase point now is off the coast of Chile and Equador, oh, maybe, 10 or 15 degrees of longitude, and it is fairly dull. It does not seem to indicate any great amount of choppiness or wave action in that area.

CAPCOM Roger.

SC And about 15 minutes ago, Gordy, I took 2 more Hasselblad shots of the Earth.

CAPCOM Okay.

SC And also, Houston, frame number, let's see, that's 16 and 17 were taken of the Earth about 15 minutes ago, too. And it's magazine Sierra, Sierra.

CAPCOM Okay, Ron, we copy that.

SC Gordy, with respect to the ice pack off the coast of Antartica, it's difficult to distinguish pack ice from clouds, in general. However, the clouds seem to pick up reflection patterns with respect to the Sun, and using that and some shadows below as the criteria, it looks as though the pack ice in the South Atlantic would extend to a latitude almost comparable to that of Tierra Del Fuego. I don't know whether that, that's reasonable or not.

CAPCOM Okay, I don't either, but maybe someone who's more of an expert can clear up your question on that. Ill let you know.

SC Yes, now to the southwest of Tierra Del Fuego there's a, looks like a small cyclone developing, clockwise rotation, just off the edge of the pack ice, and, but it does not seem to be closely associated with the frontal activity that I mentioned when I started.

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SC out speaking at this particular time.

CAPCOM Roger.

SC There is another one, maybe a front, a little bit ahead of that cyclone, that's now extending north-south, starts in the pack ice area and extends up, oh about halfway from there to Buenos Aires, in the direction of Buenos Aires.

END OF TAPE

SC Buenos Aires. It doesn't look like a very major mass of air, or frontal system. It may develop into something over the next couple days though.

CAPCOM Okay.

SC And centered, Gordy, at about 45 south, and say 30 west, there is another cyclone area that's ahead of the last one I talked about. That doesn't look, I think I talked about it yesterday, still does not look too strong, although, the clouds as I recall, the cloud cover is somewhat more well developed and circulation patterns seem to be better developed. It may be an intensifying storm over what we saw yesterday.

CAPCOM Roger.

SC I can not see that it is associated with any clear frontal activity however.

CAPCOM Okay.

SC That, I presume, should be migrating in the direction of the southeast coast of Africa, so we'll keep an eye on it.

CAPCOM Rog.

SC That reminds me, did you get any information on the, that, what looked like a very strong concentrated typhoon or hurricane in the south Pacific between Borneo and the Philippines?

CAPCOM Let me check and see what we got on that. I wasn't here when you first talked about it evidently.

SC Well, it was one that they didn't seem to be carrying and it looked extremely well developed from here.

SC Gordy, yesterday that one, the one I'm speaking of was centered at about 15 north and 117 east.

CAPCOM Okay, I've been informed that the satellite people are carrying that one now. I'm not sure whether they had seen it before or until after you did. But they are aware of it now, and are tracking it.

SC Well, we're not competing. They just didn't have any information for me on it yesterday. We'll probably be able to see that again late this afternoon.

CAPCOM Okay, the one that you just gave the coordinates on, does have a name, Therese. Hurricane Therese. And, so the other one must be the, must not have a name.

SC Okay, now which one has - is Therese.

CAPCOM The one you just - the coordinates you gave almost exactly pinpointed Therese.

SC Okay, that's near the Philippines.

CAPCOM That's affirmative. Between there and Vietnam.

SC Okay, well, then that sounds like that's an up to date position. It has relatively little movement since yesterday.

CAPCOM Rog. They show it moving just very slightly westward.

SC Okay. Are they carrying anything south of Guam now, that we talked about yesterday?

CAPCOM Ah, take a minute to get something on that. They don't have a current map showing anything in Guam right now.

SC And we also had a storm developing south of, or southwest of New Zealand. Might look at that one too.

CAPCOM Okay.

CAPCOM Jack, are you making these observations through the monocular?

SC Ah, yes sir. Although most of them, well at this distance, Gordy, the circulation, the detailed circulation patterns to say what is a cyclone and what isn't, are not visible to the naked eye. At least not to mine.

CAPCOM Rog.

SC The major frontal patterns are however.

CAPCOM Jack, that disturbance you mentioned near Guam isn't being carried on the current chart here as anything significant. They do show some cloudiness north of the tropical convergence zone, but, just that.

SC Okay, well, I had a feeling that what I was seeing yesterday might of just been the remnants of Therese, which I think went down into that area a couple days ago. It was not a very well developed system, but did seem to be isolated from the other cloudiness that I would of put into the tropical convergence zone. That was between Wake and the Kwajaleins.

CAPCOM Roger.

SC Gordy, let me try to give you a discription of something that is a little bit unusual than what we've been seeing. The, there's an axis that runs from, say the outer portion of the Ross Ice Shelf along the, and just off the coast of Antartica, then bends up so that it would pass just to the east of Tierra Del Fuego and then continues on that heading so that it would intersect the far east coast of South America if it continues. Now along that axis the, what appear to be multiple frontal patterns, or at least linear cloud bands, bend very sharply and change from a heading that roughly parallels the axis around the one that is roughly north-south. And some of the frontal direction changes that I gave you earlier, down in that area are also bent around that axis.

CAPCOM Okay.

SC And there isn't, oh, there's probably a dozen if you tried to pull 'em out cloud band between the Ross Sea and Tierra Del Fuego that bend around the same axis.

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SC Quite striking.

CAPCOM Roger.

SC Now there's some indications to me at any rate, that the jet stream in that area may be essentially east-west, oh, maybe 20 degrees of latitude north of the Ross Sea and then bends down very sharply so that it intersects the, or approaches the Antarctic Ice Shelf to the east of the Ross Sea and then maybe it bends up and forms the axis I just described that is causing that bending of the cloud pattern.

CAPCOM Okay. Sounds like a good theory.

END OF TAPE

SC -- there's a linear clear area in that area north of the Ross Sea that -- and to the north of that is a sharply defined front that I talked about earlier. And, then both -- that front continues, the clear area is cut off by the axis that I described, the cloud axis.

CAPCOM Roger.

SC Now, that should show up real well on the 250 millimeter pictures we took --

SC Gordie, I'm back looking at zero phase, and now, apparently the exact zero phase was partially obscured by a cloud pattern earlier. Now, when I -- there is a very, very small bright spot in the center of the zero phase area. Nothing comparable to what I described off the coast of Australia yesterday, but an extremely small spot. I suspect that the size of your bright spot in zero phase has some direct or indirect, at any rate, relationship to (garble).

CAPCOM Roger.

SC Gordie, as you might expect, the whole coastline of Chile -- or all of Chile, practically, is clear, beautifully exposed to us here, in particular the Atacama Desert, which is noted for that particular characteristic. And, at least among geologists it is. And, the coast of Peru is also clear with clouds following the Andean Ridge, probably the -- certainly the coast side of the Andean Ridge. Lima ought to be enjoying a very nice day today. The Ecuador, however, looks like it might have a little more cloudy weather, although it doesn't look like any major storm activity.

CAPCOM Roger.

CAPCOM America, Houston. We have a couple of words here on medications. Is everyone listening?

SC Yeah, we're on, Gordo. Go ahead.

CAPCOM Okay, Gene, you mentioned taking a nausea pill for some gas yesterday, and we were looking into some of the side effects. You definitely don't want to use that particular pill for gas. One of the side effects is that it is an appetite depressor, and there are some pills loaded in A7 along with the vitamin pills specifically for the purpose of eliminating gas. We would appreciate it if you'd give us a call in advance prior to taking any medication except the Seconal and aspirin. Over.

SC Okay, Gordie, will do. I was aware that those gas-depressors were around. At the time, we couldn't find them in A7, and so I took one of those other things, whatever it is, and while you're talking about that, as per the preflight food check, gas is very evident, particularly on me, and I think I'm suppressing it slowly, but is there any problem, or what do you recommend on that Mylinol -- or Mylicon, or whatever it is?

CAPCOM Okay, stand by one.
SC It goes hand-in-hand with the amount
of gas that I experienced preflight.
CAPCOM Okay.
SC And it's the kind of gas -- it's the kind
of gas that just stays in your stomach.
CAPCOM Roger.
CAPCOM Okay, Gene, on the recommended use of those
gas pills is to chew one after each meal, and then, if needed,
chew up another one before going to sleep at night.
SC Okay, fine. I chewed one after breakfast.
CAPCOM Okay. A little water after you chew it up
I guess helps its effectiveness.
SC That's a basic requirement, I believe. The
effect of it has not been too obvious yet, though.
CAPCOM Roger.
SC Gordie, do you want the O2 heaters 1 and 2
to AUTO now?
CAPCOM That's affirmative.
SC Okay. They're there.
SC Gordie?
CAPCOM Go ahead.
SC I don't want to cause any concern on that
gas. It's no real great problem. It's just a slight discomfort
that's all.
CAPCOM Okay, Gene. I think we understand.
SC Gordie, I have just eaten my first peanut
butter sandwich in orbit around the Earth.
CAPCOM Rog. How was it?
SC What's that?
SC Well, it was just as good as it was when I
was growing up. Which means it was great. I grew up on those
things, as I recall.
CAPCOM Charlie Duke is here with me and he --
SC (Garble) sure have missed the lettuce and
mayonnaise on mine, though.

END OF TAPE

SC And Houston, we'll go ahead and maneuver onto the LM attitude.

CAPCOM Okay, we're watching. Punch it in there.

SC Okay, directo 2 is coming open now.

CAPCOM Okay.

SC Directo 2 is off.

CAPCOM Roger. America, before you open the equalization valve, we'd like one final reading on the LM CM Delta P.

SC Oky doke. Okay, with this cabin pressure, now, 3.5, almost 3.6.

CAPCOM Okay, Ron. Jack, Houston, we're ready to terminate the charge on battery A.

SC Stand by. Good. CSM LM pressure equalization, huh? Okay, cryo pressure indicator to surge 3 and verify cryo. Wait a minute. See if I got the right one here. Recto 2 is on. Okay, Gordo, I cycled the cryo pressure indicator from, up to NOUN back to surge 3 and we got a master alarm, and there was no (garble) flow with it at all.

CAPCOM Okay.

SC Okay, I just did it again to verify it, and that picked up, it picked up the master alarm, although it might be associated with the fact that surge tank is down and coming back up.

CAPCOM Roger, Gene. Although, the surge tank shouldn't have caused it.

SC Okay, let me give you one more try on it. Well, that time it didn't weigh it. All I did was go up to 1/2 and the alarm came on.

CAPCOM Roger.

SC Okay, I went back to surge 3, it did not, so maybe it's coming on when I go up to 1/2.

CAPOCM Roger.

SC Yes, there it is Gordy. It's definitely repeatable. I can go up to pressure cryo quantity 1/2 and the alarm comes on.

CAPCOM Okay, Gene. I understand.

SC You might note that, Gordo, you might think about the fact that we were getting them when the cabin pressure was high after launch. There might be some association there, also.

CAPCOM Okay, a good observation.

SC Good. Switched the cabin selector to off. We got to unbolt (garble). Underneat the commander's couch. Okay. Repress package valve off, should be off. Okay, verify directo 2 is closed. Okay, temperment valve LM Command Module Delta P. Okay it's greater than 3.1, it's up around 3.6. Okay, we've got both the pressure equalization valves.

END OF TAPE

SC Okay, Delta-P is two and a half and Gordie, battery H charge has been stopped and the battery compartment pressure is still reading .6.

CAPCOM Roger, Jack.

SC Okay, that's a Delta-P 2 and closing equalization valve. Yes, we'll monitor for 3 minutes now.

SC You know, Houston, we just wanted to verify that no - none of the lights in the matrix were flashed when you operated that switching of the master alarm.

SC That's affirmative, Gordo none of the lights flashed at all.

CAPCOM Roger.

SC When we get the cabin pressure down Gordie, here we might try it one more time, which Gene just did.

CAPCOM Okay, and nothing happened?

SC That's affirm.

CAPCOM Roger.

SC Okay, still holding at 2.0 on the Delta P. Okay, we'll open the pressure equalization valve and when cabin pressure comes to 40 have to repress O2 SMG. Delta P is about .6 we might make it this time. Okay, I'm going to open her right up Delta P is .2 now.

SC Okay, Houston the hatch is open.

CAPCOM Roger.

SC Okay, the extend latch is engaged red is not visco, GN2 bleed button. Okay GN2 bleed not too much in there. Okay, preload selector lever rotate parallel to the orange strip. Okay, preload anul torque clockwise to unload the old support beams. Ah, the probe is back - oops, probe is loose in the tunnel - okay rotate away from the orange strip. Okay, we'll probe umbilicals is the LM power proceed it doesn't make any difference. Dock probe circuit breakers - (garble) that's good and tight. Get the sergeant - Okay - Son of a buck okay, I'm trying to put those things back on right now just for the heck of it. Just brand new nice and tight. Smell nitrogen - smell something up here. Okay, probe umbilicals disconnected and stow electrical connector cover is closed. Yeah, Yeah those are yellow ones. Preload anul position against the umbilical connector, okay that's done. Vector lever is in the mid position in place and strut. Okay, installation of strut is unstowed capture latch release handle lock. Okay, the release handle is unlocked. Okay, ratchet handle is unstowed to the full extension boost to the first detent. That's good and tight going back to the first detent. Whole probe looks like. Here it comes. That's just like in

SC the simulator it comes down by itself.
Pushes me out of the way as a matter of fact. Okay, I'll
get it a little better. Okay, ratchet handle pulled to the
full extension and then ratchet one stroke. Use it so it
gets it off the thing. Okay, that's one stroke backwards
now. Okay ratchet handle in insulation strutt are restowed
cut their lines and release handle. Okay, cut the lines release
handle is rotated 180 degrees and it's back in the recess.
Okay, we'll see if it comes out. Here it comes. I couldn't
see it a while ago let me look the probe strutt's in the
way that's why you can't see it till now. Where do we want
to go with this thing down over here at the - -

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/8/72 GET 39:57 CST 15:30 MC 180/1

SC Houston, it's a nice clean (garble) and release there on top of the probe. It's nice and clean down there. The button is depressed. There's play around the little button on the end of the probe there, too.

CAPCOM Okay, Ron. In about 1 minute, we're going to have a sight handover. You'll be talking through Hawaii after that takes place.

SC Okay. What's the docking angle. Blew it I guess. 1.2 degrees, huh? Yes. I think I better verify that just to make sure. (garble) that looks great. Wait a minute Gene, wait a minute. You got ... there we go.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/8/72 CST 15:44 GET 40:11 MC181/1

PAO This is Apollo Control. Cernan and Evans at this time have gone into the Lunar Module, and they're going through the housekeeping transfer of items from the command module into the lunar module and will proceed with the checklist of activating the spacecraft, or lunar module, spacecraft communications system, and the communications have been split into two links on Earth, Air-to-Ground 1 for the command module, and Air-to-Ground 2 for the lunar module. They're on hot mikes of a voice-actuated circuit, so we can hear them run through the items as they accomplish them aboard the lunar module, Challenger.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/8/72 GET 40:25 CST 16:00 MC182/1

PAO This is Apollo Control, a correction on the earlier statement, it is Cernan and Schmitt in the Lunar Module Challenger at this time. Evans had the detail of removing the probe and drogue earlier, but he's by his lonesome, back in the Command Module.

SC Am I not looking in the right place?

SC Let me look. I don't know where one is right off hand. I'll check here.

SC Well, just help me with some terms here. I was just looking again at sight of, underneath the power bungee.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/8/72 16:14 CST MC-183/1

SC Okay, Gordy, we're at the top of 1-13 and all switches, valves were in proper configuration.

CAPCOM Okay, you could have ask me and I could have told you that.

SC We were just trying to give you a plug, well, if you don't want 'em well, we'll take it back. (laughs) I shouldn't have said anything to the world's most experienced DLMP. Right?'

CAPCOM Rog.

SC (garbled)

CAPCOM Ron, at first glance it doesn't look like you have one on board, (garble). We're still looking though, but I don't think we have one.

SC Well, it's was kind of the conclision I came to when I didn't find it in the system data - hey, I got a little bit to tell you about that, oh, those little ones underneath the power bungee.

CAPCOM Okay, go ahead.

SC Okay, if you look at the docking lights, number four up beside of that oh, kind of a (garble) looking thing. There is a snowman. In other words, a great big fat thing with a head on top of it. And if you consider the fat thing with the head on it as a snowman, well then the snowmans head, is pointing out a 9:00, on that one. Whereas one that's fully cocked and latched over there the snowman's head points up at about 11:00. And - okay, there is a lever that comes right out of the bottom of the power bungee it looks like, and then it comes out of the bottom then left out of that lever is another silver slot or silver bar that goes from the lever to the J hook with the snowman on it. That particular thing that connects the J hook to the lever coming out of the bottom of the bungee is visible. In other words it's not sticking back underneath the J hook. It's visible.

CAPCOM Ron, we've got just a line drawing here and we've still haven't got with you on what's what according to the drawing. Maybe, you can hold off until we get a model of the latch then we can stay with your description.

SC Oh, okay, Gordie.

CAPCOM I'll give you a call.

SC Okay.

SC It's up to you. (Garble). I want to float up in the tunnel. Do you want to float up and look?

SC You know the congestion I had all day yesterday is just about gone.

SC Gordie, you'll be happy to know that putting the LMP's camera together is 500 percent easier in zero gravity.

CAPCOM Roger.

SC It becomes a two hand process.

END OF TAPE

SC Is that temporary stow?
SC Hey, Jack if you get a chance take a picture back this way.
SC Okay.
SC Putting the cue cards up now and the camera by the way, Gordie operated for 2 frames and the resolo clean lens looks clean and everything's fine with it.
CAPCOM Okay, Jack sounds good.
PAO This is Apollo control. Schmitt and Cernan at this time still in the lunar module going through the activation and housekeeping chores that are scheduled in the flight plan. They entered approximately on time as indicated by the flight plan. Meanwhile, here in the control center one of the docking collar capture latches is here in the control center being examined by flight controllers trying to sort out why some of the latches apparently did not fully engage during the docking operation. Spacecraft now 140 451 nautical miles from Earth velocity now is 3 683 feet per second. Continuing to stand by on air ground 2 for a conservation from the crew of Challenger.

END OF TAPE

SC The regular type, huh?
SC Okay, Gordo, on the top of 1-15, we're ready
to go ahead and transfer the power. We'll give you a call.
CAPCOM Okay, Geno.
SC Okay, the LM power circuit breaker is in.
What the -- let me know what you want, okay? Okay, going to OFF,
RESET. Okay, back on. And, I have to open my (garble) again.
The pressure's been? I don't know what it is.
SC Okay, Houston, we got a good transfer.
CAPCOM Roger.
SC Got it again by hitting the panel.
CAPCOM Ron, this is Houston.
SC Yeah, go ahead, Gor.
CAPCOM Okay, we've got considerable conversation
going on here about that docking latch, and it's not at all set-
tled yet. The primary thing we want to guard against is the
possibility that it is malfunctioning and that we get it latched
down on the ring and can't unlatch it, and, therefore, have prob-
lem with undocking, or possibly even prevent it. So, we'd like you
steer clear of that until we come up with a final solution. No
experimentation, please. Over.
SC Okay, I understand. I'll leave them alone.
And, just one little other bit of information to let you know
the handle itself is not free at this point to come on back down
like it's -- you know. Like, if it were fully cocked, the handle
itself would be free to come back down. It is not free, I did
not try to put a whole lot of pressure on it, but it's not free.
CAPCOM Okay. I understand.
SC Okay, Houston. Glycol pump 2 is on, it's been
on about a minute, and we've got good talk-backs from batteries
1 and 4.
CAPCOM Roger, Jack.
SC (garble) CDR busses are 262.
CAPCOM Roger.

END OF TAPE

SC Okay, Jack, you can go ahead and switch onto High taps on 1 and 4.

SC Yes it works. Okay 1 and 4 on High taps

CAPCOM Roger.

SC Houston, glycol pressure is 22.

CAPCOM You faded out, Jack, say again on glycol pressure.

SC Roger. It's 22 decimal 0.

CAPCOM Okay.

SC Well, you can cut off the decimal.

CAPCOM Okay, stand by 1. Okay, it's on Jack. No, wait a minute, I got to go get it. Which one you on? A. Okay. Okay, Jack, I'm simplex Alpha. Okay, try it again. I got the how me. Okay, Jack you're cutting out on everything,. and all I'm getting is the end of your transmission there. Okay, I'm counting 1, 2, 3, 4. Jack you read me? Okay, you, you were unclear after your first two words in every case, just like you were cutting out on Bob. Got it all that time. You read me too? Well, that's interesting. Let me adjust the squelch on this one here.

SC Okay. They used to work. I can't hear the squelch on any of those.

CAPCOM Jack, (garble) your main transmitter and receiver off and B transmitter (garble).

SC Okay, Gordy.

SC Okay.

CAPCOM Okay, you are loud and clear, Ron.

SC Okay, all clear that time.

SC Okay, my VHF alpha had to go to 2 on the squelch and I'm on at 3 on Bravo.

SC (garble).

SC Okay, how do you read now?

SC Okay, I took it V to 2. It's the same kind of thing I guess.

SC Okay, Houston, how do you ready Challenger? Counting 1, 2, ,3, 4, 5,. Over.

CAPCOM Challenger, Houston. They're loud and clear, although we have a lot of background noise. Not sure whether that's getting through. Do you know if Ron is still on (garble)?

SC (garble).

SC Hello, Houston, America. How do you read?

CAPCOM America, this is Houston. Over.

SC Okay, stand by, and Challenger is going to give you a call on S-band, and VHF checks are both go on A and B.

CAPCOM I think I side marked on Challenger, we are getting some data. We'll stand by for another check.

SC We acknowledge that. I heard him the first time. Okay, you ought to be getting in (garble).

SC Okay, Houston, this is Challenger. Counting 1, 2, 3, 4, 5. How do you read?

APOLLO 17 MISSION COMMENTARY 12/8/72 GET 41:06 CST 16:42 MC186/2

CAPCOM Challenger, Houston. You're loud and clear, with the background noise.

SC We don't have a good up link, Gene. I had signal strength. And now I don't have any at all.

SC Okay, Houston, Challenger gave you a call, but he does not have any up link signal strength at all.

CAPCOM Okay, and we'd like him to hold this configuration right there, until we get things straightened out and we understand what the problem is.

SC Okay, understand hold configuration there. He just got about 2.2 on the signal strength.

CAPCOM Okay, Gene.

SC And tell them I heard their transmission to you. Oh, a few minutes ago. I was at zero signal strength and I heard their transmission, (garble). One of them. The first time they acknowledged, that I was going to do it.

END OF TAPE

SC Did you shift my hose back?
CAPCOM Hello Challenger, this is Houston. Do you read me?
SC Okay, Houston I read you. Your weak but clear signal strength is fluctuating. When you called me it fluctuated down to about 1.6. Over, and 2 now.
CAPCOM Okay, Jack your loud and clear. The background noise I've been mentioning although I guess you haven't mention it till now is what we expect in down voice (garble) and low bit rate. How have you read this transmission all the way through, over.
SC Did he say, say again. Gene, did he say say again. I got a little bit - oh he's got three point -
SC Their not talking to us this time.
SC What? Okay, Houston, I've got 3.4 on the signal strength and try me again.
CAPCOM Okay, Challenger your coming in loud and clear how do you read me, over.
SC Okay, Houston, I know you tried to transmit I could just barely tell that. I could see the signal strength vary down to three you were modulating apparently, but your not getting through to me.
CAPCOM Okay, Challenger I'm transmitting symul now in both S-band frequencies and it sounds to us like for some reason when I transmit the uplink signal starts to break up. It's just the way you see it over.
SC Okay, Gordie you're breaking up there. Your still modulating but I cannot read you. Would you tell America what you said.
SC Yes, Gordie we read you in America loud and clear on that symul.
CAPCOM Okay, Geno.
SC Is he talking, Gene?
SC As soon as he starts trying to talk the signal strength drops off about 4 tenths.
SC I heard him loud and clear one time when he called you guys.
CAPCOM America and Challenger we're going to hand over to a different site and try that. (garble)
SC What else do we have to do, get some of these mags stowed?
SC I've got to stow the mags. Here put the PPK where it belongs.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/8/72 17:01 CST 41:26 GET MC188/1

CAPCOM Challenger, this is Houston (garbled)
How are you coming?
CAPCOM Challenger, this is Houston. How do you
read me?
CHALLENGER (garbled)
CAPCOM Back in Houston?
CHALLENGER Right, Gordo.
CAPCOM Okay, Jack, I think, answered but he was
completely lost in the noise. I could just barely hear somebody
talking. Could hear us Okay?
SC No, if he did hear you, he didn't answer.
CAPCOM Okay, it was my inagination then.
CAPCOM Challenger, Houston, how do you read?
CAPCOM Challenger, Houston, how do you read?
SC (garbled)
CAPCOM Hello, Challenger. This is Houston.
1, 2, 3, 4, 5, how do you copy. Over.
SC (garbled)
CAPCOM Can you tell Jack, ask him to verify
he's on aft OMNI?
SC Okay, I'll have him verify he's (garbled).
CAPCOM That's affirm, he's verified. Okay.
SC (garbled) earlier when he was (garbled)
that he (garbled).
CAPCOM Roger.
CAPCOM But on this last set of checks we didn't
hear anything, (garble).
SC Apparently not.
CAPCOM Okay.
SC There was one time earlier when he had
zero signal strength where he said he could hear you trans-
mitting to us very weak, but clear.
CAPCOM Okay.
CAPCOM Hello, Challenger, hello, Challenger,
this is Houston. How do you read?
CHALLENGER Okay, you're loud, and clear Gordy, you're
not very loud but very clear.
CAPCOM Okay, Jack, we can hear you about one by one in
the midst of a lot of noise, but we could tell you sound okay.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/8/72 CST 17:09 GET 41:35 MC189/1

SC Nope. I've got two now instead of three.
CAPCOM Challenger, this is Houston. Going up to you through Bermuda, and you should come down through Goldstone. How do I sound now?
CAPCOM Challenger, Houston. How do you read?
SC Till 1.8. 1.8. Yep. Never heard of him.
CAPCOM Hello, Challenger, Houston. How do you read?
SC Gordie received me, didn't he? Well, he started to say something, but then he dropped off.
CAPCOM Roger, Houston.
CAPCOM Okay, we're going to go back to Goldstone, both up and down, and we'd like Jack to do Step 406 on the checklist, in other words, go to voice. S-band voice-to-voice the biomed to right. And, we're going to give it a try in the normal configuration. Over.
SC Al74 and 76, gentlemen. Biomed right and S-band voice-to-voice.
CAPCOM That's affirmative.
SC (garble)
CAPCOM Roger.
SC Houston, do you read Challenger?
CAPCOM Roger, Challenger, read you weak but clear. How do you read?
SC Okay, Houston, you just came in loud and clear. How do you read?
CAPCOM Okay, and that time you're loud and clear, Jack. Sounds real good.
SC Okay, Gordie, let me say once again, way back when we first started, and Gene was talking to you, I heard one of your answers, weak but clear, with 0 signal strength showing here. Now, that might have been through Ron's VOX, I don't know. Since then, you've been able to modulate the signal strength with occasional weak words, and then, that signal strength was up around 32 where it is now. Then, you came in loud and clear with a broadcast. I answered you, you said about three words then dropped off completely. And, then we changed configuration.
CAPCOM Okay, Jack. That correlates with what we've seen here in the way of signal strengths dropping in and out. Stand by and I'll see where we want to go from here.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/8/72 CST 17:17 GET 41:44 MC190/1

CAPCOM Challenger, Houston. We'd like you to do
Step 7. We'll check out the telemetry and have that ready.
SC Okay, Step 7.
CAPCOM And, Challenger, Houston. Making a voice
check. How do you copy?
SC Roger. You're loud and clear. How are we?
CAPCOM You're loud and clear.
CAPCOM Challenger, Houston. We're looking at the
high bit rate for a minute here while we're waiting. Would you
check the cross-tie circuit breakers, panel 16 to verify
they're open?
SC That's verified. Cross-ties buss and
(garble) open.
CAPCOM Roger.
CAPCOM Challenger, Houston. We'd like for you to
accomplish step number 8.
SC Roger. Step 8. Okay, Houston. How do you
read the Challenger, 1, 2, 3, 4, 5? Over.
CAPCOM Challenger, you're loud and clear. How me?
SC Loud and clear.
CAPCOM Roger.
CAPCOM Challenger, Houston. Go ahead with step 9
report the ed bat voltages.
SC Wilco. Stand by.
SC Okay, Houston. Ed A and B are 37.2.
CAPCOM Roger. Okay, and go ahead with Step 10, and
then we'll go back and try to find out what's wrong with down voice
backup.
SC Gordo, say again, please.
CAPCOM Go ahead and check the sequence camera, if
you haven't already, Jack, and then we'll have some steps for you
to check out what was wrong with down voice backup.
SC Alrighty. Stand by.
SC Sequence camera is GO.
CAPCOM Okay.
SC And, I'm ready for your step.
CAPCOM Stand by one.

END OF TAPE

CAPCOM Challenger, Houston, we'd like the ranging switch to OFF reset, and the voice switch to down-voice back up, and give us a call. Over.

SC Okay, I'll preset it on range and down-voice back-up on voice.

CAPCOM That's affirmative.

SC Okay, Gordy, I got voice back up. How do you read me?

CAPCOM Change that. You're readable, your're okay, Challenger, we read your transmission but you're just about lost in the noise. Give us another count, please.

SC Okay, Houston, this is Challenger. You were loud and clear. Loud and clear. No different from the transmissions in-voice and counting 1 2 3 4 5. How do you read? Over.

CAPCOM Okay, Jack, I got a lot better. You're perfectly readable now. Sounding good.

SC That sounds good.

CAPCOM Okay, Jack, would you go to high bit rate?

SC Roger, Challenger, high bit rate.

SC How do you read high bit rate?

CAPCOM Okay. Still the same. Loud and clear.

CAPCOM Okay, we'd like biomed OFF now, Jack.

SC Roger. Going biomed OFF. Okay, Houston, how do you read the LM. Down-voice back up, biomed OFF. PCM high. Over.

CAPCOM Okay, Jack, you're loud and clear.

SC Okay, Gordy, and that was hot mike. It's working fine up here. And you're loud and clear also.

CAPCOM Okay, Jack, let's try PCM low now.

SC Okay, talking to you down-voice back up biomed OFF, PCM low. How do you read? Over.

CAPCOM Okay, same old loud and clear.

SC Okay, Gordy, certainly is clear up here. You're coming through 5 by and Bingle string 3.2, all appearances up here that previous problem was an uplink. But I guess you were not reading me. Is that correct?

CAPCOM Well, I was, the answer is yes and no at various times. We think though we have a good handle on the problem.

SC Okay, very good.

SC Are you ready for us to press on here, Gordy, we're all stowed and in pretty good shape in the LM.

CAPCOM I would like just one more switch first before moving on. Tip the updater link switch to OFF.

SC Okay, that is verified OFF.

CAPCOM Roger.

CAPCOM Want you to standby a minute or two, Jack, until we verify a funny looking parameter here on that uplink switch.

APOLLO 17 MISSION COMMENTARY 12/8/72 17:27 CST 41:53 GET MC191/2

SC Standing by.
SC What's that?
SC No, they got something looking funny on
the uplink, think on the uplink switch.
CAPCOM Challenger, Houston, that was a bad call.
We were reading the data wrong. You're clear to press on
with the checklist now on page 1-20.
SC Okay, we'll pack on.
SC You know here is your jettison bag, you
can give back to Ron.
SC Okay, S-band PR OFF, VHF OFF; I can hear
you. BM OFF.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/8/72 GET 42:00 CST 17:33 MC192/1

CAPCOM Roger, Geno. .
SC Okay, Houston, we just transfered to CSM
power and the caution warning light did go off.
CAPCOM Roger.

END OF TAPE

SC Gordo, we're about wrapped up here in Challenger. It looks like there's some life in the old bird, huh?

CAPCOM Roger.

SC Okay, we'll give you a call when we get the hatch closed. Ron's doing some housekeeping in the command module, and we're going to take it slow getting back in.

CAPCOM Okay, Gene.

SC Okay, Houston. The drogues are going in.

CAPCOM Roger, Ron. We've got a couple of questions for you about those -- about the latch. Good old latch number 4 gave us problems I guess, huh?

CAPCOM America, Houston.

SC America, go ahead.

CAPCOM Ron, can you take a look at latch number 4, and is the hook back away from the ring approximately one inch, as opposed to rubbing against the ring?

END OF TAPE

SC America, Houston, did you copy my question?
SC We're going back to air ground one. Okay,
I heard somebody going to air ground one that time.
SC Roger, Ron. Got a couple of questions
on that latch number 4 if you can answer it for me.
CAPCOM America, Houston.
CAPCOM America, Houston. We're back with you
after some site change, over. How do you read?
SC Okay, loud and clear. How me, Bob?
CAPCOM Real good, Ron. On that number four
latch number four is the hook back away from the ring about
one inch as opposed to resting against the ring. Do you
have about an inch clearance on that hook right now?
SC Well, it's about a half inch.
CAPCOM Okay, understand about a half inch. And
what position what the latch handle when the hook was first
moved back, Ron, was it kind of like in a normal stroke back
or was it just flopping back?
SC No, when I first looked at it the latch
handle was - see the hook itself was over the ring when I
first looked at it.
CAPCOM Rog, we understand that.
SC The hook was over the ring and the latch
handle was flush you know it looks just like a normal hooked
docking latch.
CAPCOM Roger, understand.
SC And, Bob, this is Gene. I can confirm
that it did not fold back easily because I checked it yester-
day. I checked to see if the hooks were over as well where
the handles would fold back. But I obviously didn't check
to see whether that one was seated. But the handle was
locked.
CAPCOM Roger, understand. And the first thing
you saw was the depression in the bungee. Is that affirm?
SC Yes, that's affirm. And the bungee is
depressed about three eights - three eights to a half of an
inch.
CAPCOM Roger.
SC You can push the - you can push the hook
about an inch away from the ring, but the normal just a
resting position on the thing is about a fingers width or
a half an inch from the ring.
CAPCOM Roger, the hook is loose so it flops a
little bit, you can move it back and forth. Is that affirm?
SC Yes, I can move it about a half an inch
to an inch from the edge of the ring. Clearing the edge of
the docking ring.

CAPCOM Roger, Ron when you pull the hook - when you pull the handle back did you reach and pull the hook back with it or did it come back with the handle like a normal pull back then.

SC No, the hook did not come back with the handle. The hook did not come back with the handle. Although when I pulled the handle back to - which is kind of a normally uncocked position. And then it wouldn't go any farther you know it wouldn't go any farther. And then the latch itself or the hook or the J hook I'll call it the hook. I moved it off the docking ring back to this position which was about an inch or an half an inch from the docking ring. And it stays right there now. And I can't push it up into the docking ring at all. Can't push the hook back up to the docking ring at all.

CAPCOM Okay, we copy that.

CAPCOM Okay, Ron, our plan here is to leave it like it is. We're going to think about it tonight and we'd like you to just leave it alone, okay?

SC Okay, sounds good. It'll clear the docking ring, no problem.

SC Houston, America. While Ron is putting in the probe and getting the hatch back in I'm going to go ahead and maneuver. How does that sound?

CAPCOM That's real fine, Gene.

PAO This is Apollo control at 42 hours 27 minutes ground elapsed time. We're estimating the change of shift press conference in 15 minutes, 15 minutes at 6:15 central time in the small briefing room. Spacecraft communicator now is Bob Overmeyer. During this past check-out of the lunar module. We've had considerable difficulty in some of the communications configurations in the way the down links and the uplinks were set up. And some bit of difficulty in sorting out just what the nature of the problem with one of the docking is. People will be examining this through the night and during the checkout of the LM tomorrow or additional work in the LM perhaps the thing can be sorted out. Apollo 17 presently at 143 562 nautical miles from Earth traveling at a velocity of 3 590 feet per second. At 4228 and standing by this is Apollo control.

SC Bob, are you all going to want OMNI or high gain on this.

CAPCOM Stand by. We're all locked on the high gain we'd just like you to leave it on high gain. The angles you see in the flight plan are in case it breaks lock. That's what you need with this attitude.

SC Okay.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/8/72 CST 18:04 GET 42:30 MC195/1

SC Okay, Houston. The probe is installed,
we'll get the hatch (garble).

CAPCOM Roger, Ron.

SC I'm not going to connect the umbilicals
unless you really want to look at probe temperature.

CAPCOM Stand by on that, Ron.

CAPCOM We concur on that, Ron.

SC Okay, good.

SC Okay, Houston. The hatch went in nominally.
Once the probe installation strut was stowed in the right
position.

CAPCOM Roger.

PAO This is Apollo Control at 42 hours 41 min-
utes. Apollo 17 now 144 002 nautical miles from Earth. Velocity
3577 feet per second. The change-of-shift briefing is ready
to start in the News Center briefing room. We'll take down
this air-ground line and tape any communications during the
course of the briefing and replay them at the conclusion of the
news conference. This is Mission Control, Houston, at 42 hours
41 minutes.

END OF TAPE

PAO This is Apollo Control at 43 hours 16 minutes. Apollo 17 is 145 178 nautical miles from earth traveling at a speed of 3543 feet per second. The crew is now in the midst of the heat flow and convection demonstration. This is the demonstration designed to provide more exact data on the behavior of fluids in a low gravity field. This type of investigation is really not possible on Earth where gravity determines flow of fluids. In space the flow forces the surface tension. There are three test cells involved in this demonstration for measuring and observing the fluid flow, behavior and the results are recorded with the 16 mm camera aboard. We have about 5 minutes worth of tape that accumulated during the news conference and we'll play that for you now and then pickup live.

CAPCOM Testing, Houston. We are recommending QUADS Bravo and Delta for spin up.

SC Okay, Bravo and Delta. Thank you.

SC Okay, Houston. At 42 56 52.04. I started the stop watch and also the watch read 18 30 (garbled).

SC Okay, Houston. We started on ... we just (garbled) left the radio on linear, part of it. The little pie shaped things are changing color as we go out. The linear part of it all of the ships seemed to have been concentrated on the front edge of the glass and all pretty much in a linear direction or an XX direction. At this point in time I haven't seen any movement yet.

CAPCOM Roger, Ron. Aren't they on the (garbled) same way they were on the backup unit the other evening in the wait Room on the LM?

SC Yeah, all those chips seem to be well, in the next, I got the lineal direction, the lineal part of experiment in the XX direction. And all the chips are lined up in that XX direction on the front or the top of the glass.

CAPCOM Roger. (garbled) they were in the backup unit the other day in the Wait Room.

SC Yeah, that's right.

SC Okay, Houston. We've started the cool down and (garbled) light five position there. The radio cells, they all started to change color except the one from about 10:00 to 12:00.

CAPCOM Roger. Except 10:00 to 12:00, got it. Did the lineal ball stay right in line there, Ron?

SC Yeah, the crystals or chips that are inside there didn't move at all. I just (garbled)

CAPCOM Roger.

SC On the color patterns behind there, the one on the left, as you look at the unit, the color crystals only changed down to about nine-tenths of the first square

as you come down from the top. The rest of them are all black on that particular, on the left row.

CAPCOM Roger, Ron.

SC That's the maximum extent of. That's the max extent of the heating. You might check and see if the guys want to heat it a little bit longer the next time. When they do it in the PTC.

CAPCOM Roger, Ron. We're copying everything you're saying and we've got all kinds of support here, in fact we've got one back up unit here watching what you're doing so we'll keep you posted on what we think.

SC Oh, okay.

SC Is the back up CMP operating it?

CAPCOM Matter of fact that's affirmed.

SC That's the way to do things.

CAPCOM And Ron, we'd like you to stay nominal on the eating time due to the film in the case.

SC Okay, will do.

SC Okay, Houston. Is there film in there to allow me to keep the camera running while I try to fill up that flow (garble).

CAPCOM Standby on that, Ron.

CAPCOM It's affirmative, Ron, you can leave it running.

SC Okay.

SC Okay, Houston. The first thing I noticed as soon as I opened the flow four turns when it started running out a little bit, even without doing the inject. Okay, that's because the inject thing was open just a little bit. But it's alright.

CAPCOM Jack, we got it.

SC Okay, I'll try to squirt some fluid in there.

CAPCOM Okay.

SC With the fluid inject thing.

SC Okay, I'm taking it in quite slow. It's noted there are quite a few small bubbles coming out with it. So far so good. It hasn't overflowed the first capillary ring. And it's taken off and it's going by capillary action toward the bottom and toward the top.

CAPCOM Roger, Ron.

SC Okay, it finally met together. The part going around the top and around the bottom. Met together 180 degrees opposite of the inject port, and now is starting to go out across the middle and fill up from the inject port.

CAPCOM Roger.

SC Lot of big bubbles coming out now. That's after about a turn and a half.

CAPCOM Roger. We got it.

SC Okay, that's two-turns now. The meniscus is still holding on the first inner ring, it looks like all the way around. At least as far as I can see. The bubbles, big

bubbles have been coming out now, and also the fluid has taken over the right half of the bottom of the dish. It's starting to fill in a little bit, maybe a fourth of an inch circumference coming around from the left side opposite the injected port.

CAPCOM Roger.

SC Okay, I'll keep going here. About two and a half turns now. And looks like all of the bubbles have already come out. We're getting real fluid coming out. Sure a pretty picture anyhow.

CAPCOM Roger.

SC Okay, that's three turns. I don't believe we're going to be able to cover the entire bottom with the four turns. Okay, that's four turns ---

END OF TAPE

SC Okay. That's four turns and it covered up the right, oh, three-fourths of the floor of the thing and about three-eighths of an inch on the left side of the floor. Three-eighths of an inch of the annulus all the way around, except for the right, oh, say right two-thirds of the floor.

CAPCOM Roger. And, you can use more than four turns if you need them.

SC Okay, let's go ahead and try to cover up the whole floor on the thing before we do it -- the bubbles are in there. I'm afraid they're going to stay unless they disappear when we eat it.

CAPCOM Roger.

SC It's coming out with no bubbles now. It looked like it almost formed a meniscus on top of itself. The top of where the bubbles were.

CAPCOM Roger, Ron. Are they continuing to spread out?

SC Gas continues to spread out now, and without pumping anything into it at all -- I did that the last turn fairly fast -- it's spreading of its' own accord now, and it should go on over and cover up the bottom, I think. Once it completely covers up the bottom, I think we should go ahead and start the (garble) this battery. Okay. Now -- everything's all hooked together now. We filled up the bottom of the floor. Hey, for some reason, the bubbles seem to be starting to break now.

CAPCOM Roger. We copy that Ron.

SC Okay. I don't know if it's coincidence or what, but all the bubbles are formed together, especially in the center along the plus X axis direction and are about one inch wide and then they start about three-eighths of an inch in from the circumference.

CAPCOM Roger.

END OF TAPE

SC Okay, I was going to try to break the bubbles with a pencil, but if you try to push a pencil into the bubble, it just moves aside. Yes, so that being the case, I am going to go ahead and start the, start the timer.

CAPCOM We concur on that, Ron.

SC That's called the old push a bubble with a pencil trick.

CAPCOM Roger. Just need a sharper pencil, Jack.

PAO Air-to-Ground is live now.

SC Or a thinner bubble. This is the best Friday afternoon matinee I've ever been to.

CAPCOM How about Friday evening, Jack?

SC Well, I've lost track.

SC Stand by, mark. That was 1 minute after the start.

CAPCOM Roger.

SC I'll give another mark when I go to high on the, with the select switch. Mark it.

CAPCOM Roger.

SC Each bubble looks like it's locus of, it's looks like it's starting one of the (garble) cell.

CAPCOM Say that again, Ron.

SC Okay, each one of those bubbles looks like it's the locus, start of one of the Bernard cells.

CAPCOM Roger.

SC So far, the bubbles aren't breaking.

CAPCOM We copy that.

SC Is Stu getting, did Stu get bubbles on his pattern, Bob?

CAPCOM We're not running it down here. We're just demonstrating on the demonstrator there, but Stu can tell you.

STU Roger, Jack. Yes. I, you're talking of the one that we did, right?

SC That's right. Well I am now. I thought you were running it down there also.

STU No. Okay. The one that we did in flight yes, I had a lot of bubbles, but I couldn't get mine, (garble) across the center. So, you all are already well ahead of what I did.

SC Gee, I'm sorry you had to admit that Stu.

STU Oh, you all just do such good work.

SC Another thing is, it seems to me like in 1G, the Bernard cells started completely back to the edge, you know, right back to the edge of the circle. And in this case, at least they haven't filled in yet, back to the edge of the circle, at all. They all started out in the center and are working around the bubbles and then just now starting to form a few of them where there aren't any bubbles.

CAPCOM Roger, Ron.

CAPCOM How large are the cells Ron?

SC Well, they vary considerably in size. I can see one that's about half an inch across, and then the other ones, they've got a great big bubble in it and yet the cell itself is maybe down to an eighth of an inch. The bigger ones seem to be on the outside and, of course, there are very few bubbles on the outside also.

CAPCOM Okay.

SC And the bigger ones, generally right now, are averaging about, oh a fourth, to three eighths of an inch across the cross section (garble).

PAO This is Apollo Control.

SC The cells tend to be somewhat polygonal. Let's see, we've been going 6 minutes, 4 minutes into the eating part of it and the cells are polygonal but they don't seem to be quite as straight lined as they were on the ground.

CAPCOM Roger. Copy.

PAO Stu Roosa, Apollo 17 back-up Command Module pilot is talking to the crew now from the CAPCOM console. Stew performed a demonstration similar to this on his Apollo 14 flight. That demonstration was not as sophisticated as the 17 test and the 17 demonstration is expected to provide more exact data on the fluid behaviour.

SC It almost looks like it's reached a steady state now. It's 9 minus 2, 7 minutes.

CAPCOM Roger.

SC Okay, I think the one thing I neglected to mention

END OF TAPE

SC Gee, I think the one thing I neglected to mention is that we essentially have a convex surface from the material, in other words, convex with the high part in the middle, and, of course, that's where the bubbles are, too, but I think you'd generally have that type of a surface anyhow. And, it hasn't broken the meniscus of the lower, or the thinnest ring.

SC We should have had some popcorn on our stowage list.

CAPCOM Roger.

SC Okay, now as the Bernard's cells are starting to form in that outer annulus, then went all the way around.

CAPCOM Roger.

END OF TAPE

SC Okay, we went back to light 4 now. And we never did get any real beliginal cells formed around the outer anulous. And even the cells that were formed on the thing. Seemed like the particle flow within the cells was very slow when you compare that with the way it was in 1 g.

CAPCOM Roger, Ron.

SC Okay, I'm trying to suck the stuff back in the entry tube there and it looks like part of it's coming in.

CAPCOM Roger, Ron, we copy that.

SC And the camera is down to about 50 percent here, so I'm going to go ahead and turn it off now.

CAPCOM Roger, Ron. Ron, if I didn't tell you we concure with turning the DAC off there.

SC Okay, yes I got you. I'll turn it off. You know I just happen to think after I've already sucked part of those bubbles back in there. We've got enough fluid in there to pump it out the next time without sucking it back in there, don't we?

CAPCOM I'm sorry Ron, say that again.

SC Don't we have enough of the crytox fluid without sucking that back in there? May I can just wipe the crytox off with some kleenex and maybe there won't be any bubbles next time.

CAPCOM Okay, stand by. Ron, I guess we understand you've pulled some back in, but you haven't pulled any of the bubbles and if you pull any more in you're going to start the bubbles back in. Is that correct?

SC Yes, that's correct.

CAPCOM Okay, why don't you stand by here on that, then.

SC I'll see if I can push the bubbles out of the way here with something.

CAPCOM Okay, the consensus is, we would like to not pull the bubbles back in. Think you've got a good idea.

SC Okay.

CAPCOM It's the old keep the bubbles out of the crytox trick.

SC Okay, I'll see if I can do it.

SC I see your finally getting caught up in the humor of the thing there, Stu.

CAPCOM Oh, I've always been in good humor. It sure sounded like that babble did the trick, Ron.

SC Yes, I think it did to. It looks like it worked real well.

APOLLO 17 MISSION COMMENTARY 12/8/72 CST 19:19 GET 43:45 200/2

PAO This is Apollo control at 43 hours
52 minutes. Crytox which is a heavy oil is one of the fluids
being used in the demonstration. Apollo 17 is now 146 455 nau-
tical miles from earth, velocity 3 505 feet per second. And
this shift of orange flight controllers being directed by
Charles Lewis one of the several gentlemen recently promoted
to flight director. The regular orange flight director Pete
Frank is an observer for this shift.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/8/72 GET 43:56 CST 19:29 MC201/1

CAPCOM And 17, just so you say we didn't give you our
cue, we're standing by for the 1/17 procedures in your experiments
checklist for film cycling.
SC Okay, we ought to get that shortly.
CAPCOM Okay.
SC Okay, Stew, we got you on that, Saturday
afternoon or Friday evening matinee was absorbing us so, we almost
missed it.
CAPCOM Okay.
SC Okay, Houston. Data systems coming on.
CAPCOM Roger.
SC LOX to science, it's max power coming
on.
CAPCOM Roger.
SC Okay, mapping camera. Stand by. Mark it.
CAPCOM Roger. Mark it.
SC Pan camera mode. Stand by. Mark it.
CAPCOM Roger.
SC Yes, I guess that's verified. Pan camera
power to power. They're both in the grey.
CAPCOM Roger.
SC (garble) test is gone to heaters.
SC Okay, we're standing by for your cue on map-
ping camera on and self test.
CAPCOM Roger. Stand by on that.
CAPCOM 17, you're go for cycling pan camera and the
mapping camera.
SC Okay. Okay, mapping camera is gone on, pan
camera to self test.
SC Barber pole.
SC It released.
CAPCOM Okay, 10 seconds on the pan camera there.
SC Okay, pan camera power is coming off.
CAPCOM Roger, Ron.
SC Okay, mapping camera going off.
CAPCOM Roger, Ron. That's 30 seconds off on the
mapping camera, Ron.
SC Okay, smack powers off.
SC Stand OPS TV's off and midray low now.
CAPCOM That's affirmative.
SC Say, Bob, say again those jets you re-
commended for PTC.
CAPCOM We recommended Bravo and and Della for spin-
up PD.
SC Okay, do the rates look okay to you?
CAPCOM That's affirmed.
SC Go ahead.

APOLLO 17 MISSION COMMENTARY 12/8/72 GET 43:56 CST 19:29 MC201/2

CAPCOM Jack, when you get done with the PTC area here, we'd like you get out the flight plan supplement, we'd like to get a food report from you all on your food intake for today.

SC Why don't we give you that in the morning. Be happy to do it, but

CAPCOM That's affirmed, Jack we'd just like to have for tonight.

SC It sounds like you don't think we're eating enough.

CAPCOM Ron, would you check your NOUN 78?

SC Uh huh, thank you.

CAPCOM Roger.

END OF TAPE

CAPCOM Jack, or Ron, when you come around, we'll ask you to stow the high-gain on our call, and we'll be wanting OMNI BRAVO.

SC Roger.

SC And, are you ready for the trotting gourmets' report?

CAPCOM Roger. Everybody's here with all ears.

SC Okay. The CDR today had scrambled eggs, and three bacon squares, and a can of peaches, and pineapple drink for breakfast. And, then later on in the day, he had peanut butter, jelly, and bread with a chocolate bar and some dried apricots. The LMP had scrambled eggs, four bacon squares, an orange drink and cocoa for breakfast. And, potato soup, two peanut butter and jelly sandwiches, and a cherry bar and an orange drink. And, that hero of the matinee, the matinee idol of Spaceship America, had scrambled eggs, bacon squares, peaches, cinnamon toast, orange juice and cocoa for breakfast. That's how he keeps his form. And, for lunch, he had a peanut butter sandwich and a citrus beverage. And, that's it, since there's nobody else up here.

CAPCOM Roger. We copy that. We'd like you to stow the high-gain at this time and OMNI BRAVO.

CAPCOM Jack, we appreciate all your information, and we'd like to just pass on some recommendations here from the ground that we'd like you to keep on with your regular menu as much as possible, and if you do cut anything off, we'd like you to concentrate on eating the meats, the juices, and the fruitcake, which are the most effective for maintaining your electrolyte balance.

SC Okay, Bob. We understand what you're saying. We're shooting at eating it all. It's just a lot of food, that's all.

CAPCOM Rog. We understand, Gene. Also, on that group of foods, peanut butter's great for the electrolyte balance, also, so you're doing okay.

SC I knew it was good for something. It couldn't be that good without being good for something. I think we're all trying to make a concentrated effort also to keep quite a bit of water down.

CAPCOM Roger. I understand. Real fine.

PAO This is Apollo Control at 44 hours 18 minutes. The Flight Surgeon, John Zieglschmid, is pleased with the food report for today. Apollo 17 is 147 306 nautical miles from Earth, traveling at a speed of 3481 feet per second.

END OF TAPE

CAPCOM Hello, go 17, Houston.

SC Okay, got a little information on what we were talking about yesterday with respect to southern Pacific weather if you've got nothing else going on.

CAPCOM Hello, speak to me.

SC Okay, looks like that little cyclonic circulation we had over New Zealand is still there and looks like the front it was associated with is broken up a little bit; however, that pattern seems to be hugging the New Zealand area and, but has not intensified. If not, it may have even weakened a little bit since yesterday, hard to be sure exactly. The front does not look as strong, and it still seems to be hanging, just stabilized, and with all of Australia clear now and the western edge of that front being just off shore north of Brisbane. There is a, east of New Guinea, in the vicinity of the Solomon Islands, looks like a fairly moderate sized cyclone developing at the western edge of the front that was somewhat farther north and west than the one over New Zealand. North of that, Wake/Kwajalaine region, it was mentioned yesterday that the Aria people still seems to be in general overcast condition, but, the clouds do not look very heavy or impacted at all. New Guinea is just on the LM so, yeah, I think I lost it.

CAPCOM Okay, I think we've got you now, accepting.

SC You're loud and clear, too.

CAPCOM Okay.

SC Stu, I think we lost you about the time I lost view of the Earth and mentioned the Wake/Kwajalaine area, right?

CAPCOM That's affirmative. We didn't get much of the Kwajalaine report.

SC There was nothing new to add over yesterday, just seems general cloudiness in the area but they do not look to intense are well organized. Just probably a general overcast.

CAPCOM Okay.

SC I'll try to get some exercise and then I'll be back at you with some more information. Maybe we can see the Philippines by then.

CAPCOM Okay.

SC And Stu, I've got my biomed hooked up. Are you guys bringing it in during this exercise thing.

SC This is Jack.

CAPCOM Yeah, Jack. We'll check on that.

CAPCOM Okay, you're coming in loud and clear, Jack.

SC Okay.

END OF TAPE

PAO This is Apollo control at 44 hours
35 minutes. Spacecraft distance 147 866.
CAPCOM Rog, we're reading you loud and clear.
SC Okay, I think that big storm that Jack
was referring to has moved off well to the east of Australia.
Very definite counterclockwise rotation and then it stretches
to the south or what might even be the southeast. And then
just rolls right - we have a big frontal pattern and then rolls
right into another clockwise rotating low down there near
antartica. It gives me the impression of a parrots cone
when he's got his features ruffled. And it in turn has
another low trailing it arching and then flowing into another
low that is very near the continent down there of antartica.
They form a chain as I just described coming from - well
possibly southeast of antartica. It's hard to really tell
what east is down there on up to do west of Australia by
several hundred miles.

CAPCOM Roger.

SC South of Australia you get ahead of a
very large cloud mass from there all the way down to Antartica
that had the tendency to -

PAO This is Apollo control that was Gene
Cernan picking up Jack Schmitt's weather observations as
Jack is now in an exercise period. Spacecraft is in the
passive thermal control mode and is rotating. We've broken
lock on the OMNI antenna. We'll pick up another antenna very
shortly. Spacecraft distance 147 953 nautical miles velocity
3 462 feet per second.

CAPCOM 17, Houston.

CAPCOM 17, Houston.

SC Go ahead.

CAPCOM Just wanted to get COMM there again we
had some switch over there. You might be interested, we've
got an ATS map in here from this morning. We can see the
flow patterns in the antartica just about 120 degrees west
which is a little closer to South America than what your
calling I guess. We do see that activity down there.

SC Okay, Bob and there is a very large
cloudier mass between Australia and Antartica. It has a
tendency to want to start a rotation and you can say ahead
of that it's not too strong right now. We're seeing about
three quarters of the Earth I guess. Judging from our
clocks and what we can see it looks like the Sun is setting
right over the west coast, and it leaves us with about three
quarters of the Earth available to us.

CAPCOM Rog, it'll be about 6:15 Los Angelas
time right now so it's probably sunset out there.

CAPCOM Ron, just a reminder from the flight plan change last night you will have a P52 coming up here at 45 hours in your flight plan.

SC Roger, mighty fine thank you.

CAPCOM Roger, Ron.

PAO This is Apollo control at 44 hours 43 minutes. That was a reminder that we are approaching the time where we are going to make the first step in a two step adjustment caused by the late launch. This will be to bring the Greenwich mean time, the ground elapsed time and the flight plan together. What this first step will account for an hour of 2 hours and 40 minutes adjustment that will be made eventually. The clocks will not be recycled at this time at 45 hours. The clock recycling will be accomplished later in the mission at 65 hours elapsed time. This 1 hour adjustment consists of moving the activities that were scheduled in the flight plan to take place between 46 hours and 30 minutes and 47 hours up to 45 hours in the flight plan. Therefore, during the hour from 45 hours to 46 hours we will have accomplished all the flight plan activities that were originally scheduled to be accomplished from 46 to 47 hours. This will put us 1 hour ahead on the flight plan and we would pick up the activities originally scheduled at 47 hours at 46 hours under this plan. And this would proceed in an orderly fashion one hour ahead up to the 65 hour mark at which time we will synchronize the ground elapsed time clock to 67 hours and 40 minutes and at that time go to the 67:40 time in the flight plan and we will be back on schedule.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/8/72 CST 20:20 GET 44:46 MC205/1

CAPCOM Jack, just for information, you've got your heart rate to 103.

CAPCOM Jack, you've got your heart rate to about 103, and we lost data right now.

CAPCOM Jack, just for your information, the last heart rate we had was 103, and it's -- we lost data right now, so 103 max we saw right now.

SC Okay, I was just doing some isometrics. Just tried running in place again then.

CAPCOM Roger. Do you want us to call you your heart rate if we get data in here now?

SC Sure.

CAPCOM Okay.

CAPCOM Okay, you're up to 115, Jack.

SC (garble)

PAO This is Apollo Control at 44 hours 58 minutes. Moving the GET clock ahead at 65 hours will affect the time that has previously been given for the lunar sphere of influence crossing. Newsmen who are interested in this time should add 2 hours and 40 minutes to the time previously given, which would make the time for lunar sphere crossing now 73 hours 23 minutes 24 seconds Ground Elapsed Time. The distances and the velocities that were previously predicted will remain the same. Those are 190 725 nautical miles from Earth; 33 639 nautical miles from the Moon; and an Earth reference to velocity of 2340 feet per second. Apollo 17 is now 148 668 nautical miles from Earth --

CAPCOM -- resting, or did you quit?

SC No, I'm resting right now. Didn't seem like my arms have the stamina they did yesterday to hold the artificial G. (Garble)

CAPCOM We copied about a maximum of about 118 on your heart rate.

SC What heart rate did --

CAPCOM About 118 max, Jack.

SC Roger, understand.

CAPCOM Don't let me harrass you. I just was kidding you on that. Whatever you think is fair.

SC You're not harrassing me. When my arm's rested, I'll try again.

PAO Spacecraft velocity now 3441 feet per second.

CAPCOM Couple of interesting data points raised, Jack. We saw -- while you were doing that, we saw the PPCO2 go up, and we saw the tanks destratify again the same way.

SC Very good. Next mission I'll have to flight plan it.

CAPCOM That's affirmative.

SC You saw the PCO2 go up?

APOLLO 17 MISSION COMMENTARY 12/8/72 CST 20:20 GET 44:46 MC205/2

CAPCOM That's affirmative. Let me get the numbers that you'd want. It took a jump from 1.3 to 2.4 on that.

SC Okay. That was with two of us going, and part of the time, three of us going.

CAPCOM Roger.

SC Now, we still got one going.

CAPCOM Well, it's not unexpected. Just thought you'd be interested.

SC Sounds sort of normal.

END OF TAPE

SC Sounds sort of normal.

SC Hey, Bob, with this change in the hour, what time does penumbra start?

CAPCOM Say again the question, Jack. What time does what start?

SC With the change in hour, what time does the penumbra, what time do we enter the lunar penumbra.

CAPCOM Right now, we don't, Tommy doesn't think we're going to go into the penumbra and we're verifying that.

CAPCOM Hey, Ron, could we ask a question about the heat flow experiment setup?

SC Go ahead. Sure go ahead.

CAPCOM You mentioned that the lineal chips were all on the in the X X plane, and we're just wondering do you mean along the X X axis of the spacecraft?

SC Yes. Along the X X axis of the spacecraft.

CAPCOM Is the long X X axis of the lineal cell along the X X axis, Ron?

SC Yes, that's affirmative. It's right side up, if you're looking at the connect panel, you know?

CAPCOM Yes. That's, they'd like so that the axis of that lineal cell would be parallel to the bottom of the panel 100, as an example. It's, right now, it's perpendicular to the bottom of panel 100, isn't it?

SC Now wait a minute. Yes, the lineal thing is right now perpendicular to the bottom of panel 100.

PAO This is Apollo Control at 45 hours 5 minutes. Ron Evans is making preparations to again perform the heatflow and and convection demonstration.

SC Houston, America.

CAPCOM Go ahead, Ron.

SC Okay, I think I see what you're saying. Sorry I read the thing with lineal cell in a plus X direction, but what they mean is lineal cell up.

CAPCOM Lineal word, I guess is the

CAPCOM Rog.

SC Okay, I'll turn around the other for this PTC part of it then.

CAPCOM Wait a minute on that, Ron. We're having a debate whether we want to maybe continue the next part the same attitude or just rotate it.

SC Okay. Seems to me you'd like to maybe leave it in the same attitude.

CAPCOM Ron, the only rational reason to change it right now is we're hearing word that if you had rotated to the other way, that you'd get better pictures on the DAC due to the lighting reflection on it. The PI would like to change it back

APOLLO 17 MISSION COMMENTARY 12/8/72 GET 45:01 CST 20:35 MC206/2

CAPCOM to the other way.

SC Okay.

CAPCOM 17, just for information, we will not be going
into the penumbra.

SC Okay. Sorry to hear that.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/8/72 20:47 CST 45:14 GET MC207/1

CAPCOM Ron, CU 52, and you can go ahead and torque.

CAPCOM Ron, Houston, we're watching your 52, would you go ahead and torque.

SC Okay, Houston, 17, thought you said go ahead and torque. Is that correct?

CAPCOM That's affirmative, Ron.

SC We'll torque at 1630.

CAPCOM Roger.

PAO This is Apollo Control at 45 hours 17 minutes. Flight Dynamics Officer, Bill Boone, has just informed the Flight Director, Chuck Lewis, that 9 hours of tracking since the midcourse correction No. 2 burn, confirms the No. 2 burn was indeed a good one. On the present trajectory of the spacecraft the height, the closest approach to the Moon, is 52 miles.

CAPCOM Ron, a couple reminders, (garbled)

CAPCOM 17, Houston.

CAPCOM 17, Houston.

SC Roger, go ahead.

CAPCOM Oh, just a reminder on the LOI canister change, have you gotten into that?

SC We're not on that yet. We're, probably get started on this.

CAPCOM Okay. On the ---

SC I'm on the heat flow first.

CAPCOM Roger. Understand.

CAPCOM We'd like to know when you start on that heat flow, Ron, because we need to get the DSC to high bit rate.

SC Okay, I'm having a little trouble getting them mounted to that. It's stable position this way.

CAPCOM Understand.

SC Okay, Houston, this is 17. Ready to start the heater in 45 seconds or let me know when you get the tape recorder for it.

CAPCOM Roger, Ron.

CAPCOM Tape recorder and high bit rate.

END OF TAPE

CAPCOM Okay, we got the tape recorder in high-bit rate.

SC Okay.

CAPCOM Stand by one, Ron. We got a little change here we'd like to make on the plan on page 2-6.

SC Okay. Stand by for 0321, mark it. It's reset. Start the stop watch.

CAPCOM Roger. And, Ron, on the checklist on page 2-6 after the 16 minute end of test and proceed to next test, we'd like to turn the DAK off at that position.

SC Okay. Will do.

CAPCOM And, then, you turn it back on at the -- where it says "Reset stop watch and start the time Zero there" point. Prior to that, turn it on. I'll remind you of it.

SC Okay. Do you want to fill that pan again, huh?

CAPCOM Say again, Ron.

SC Did you want to watch me fill the pan again?

CAPCOM Yeah, Rog. Yeah, I'll be up before that whole watch has filled the pan. We just -- while you're taking time wiping it and all that, that's when we -- we don't want to use up the film there.

SC Okay. I'm with you. Actually, I've already cleaned out the little area there.

CAPCOM Roger. I've got one minute on my timer right now -- about 1:27, actually.

SC Oh, thank you. Well, we'll start at two minutes.

CAPCOM You're still on the front page with the (garble).

PAO This is Apollo Control at 45 hours 38 minutes. Distance now 149 941 nautical miles from the Earth; velocity 3405 feet per second.

SC Okay, Houston. The DAK is off now.

CAPCOM Roger. DAK off.

CAPCOM Say, Ron.

SC Go ahead, Houston.

CAPCOM Yeah, Ron. If it's not too much bother, it's one of those nice things to have. The PI would like you to take a picture with the 35 millimeter indoor of the orientation of the heat flow as it mounted. See if you can get that, if it's not too much of a problem.

SC Okay. No problem. Good idea.

CAPCOM And, that should be magazine SS, which is the same one you used for the ALFMED tomorrow.

SC Affirmative, okay?

SC Okay. Looped the flow about four turns. A little bit is running out -- one big bubble in it. And, I still have a little bit left over even though I wiped it out pretty good awhile ago. The meniscus is up to the bottom ring, and I

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think we put in eight things in there where it's going to try to get the meniscus up to the top baffle. Is that correct?

CAPCOM That's correct, Ron.

SC There must have been a few more bubbles down in there again. That was two turns now, and I've got it about half full all the way across.

CAPCOM Roger.

SC But, maybe there's just about 8 or 10 bubbles in it.

SC That's three turns. The fluid is exactly (garble). And, we're still going on the first fourth of the turn now, and we're still (garble) meniscus around the lower baffle -- the smaller baffle.

END OF TAPE

SC Okay, it looks like about 6 of the bubbles have developed into three for some reason.

CAPCOM Roger.

SC It was doing real well, then on 7th turn a bunch of bubbles came in again.

CAPCOM Roger. Ron, I might have given you a bad call before. We don't want the DAC on until just before that 2 minute mark here where just prior to going experiment heat select flow pattern low. At that point is where we want the DAC on.

SC Okay, you want the DAC on when it starts heating up.

CAPCOM That's affirmed.

SC Okay. You, know I may have lost track of the turns here, but I think we've got 7 and a half or 6 and a half turns in here. And it still hasn't overflowed that first lower baffle. I've got a tremendous concave convex surface on the fluid, but it still hasn't broken the meniscus of the first baffle.

CAPCOM Roger. We copy that.

SC Okay, I'm going to go ahead and take it another turn, because it was my understanding, we wanted to try to get in the second baffle anyhow. So, I'm going to take another turn of crytox and put some more in there.

CAPCOM That's correct, Ron. Ron, if that doesn't do it, they're saying you might want to take a pencil or something and stir it a bit to try and break it up into lower baffle into the upper baffle.

SC Okay, I'm afraid, may have it all over the place if I do that, but I'll try it.

CAPCOM Roger. Very slowly.

SC Right.

CAPCOM Ron, just a question here, while you're watching it here, do you have any bubbles in the lineal cell?

SC Yes. This one is going to be interesting. There are about a dozen, 9 to a dozen small bubbles right next to the inject board, and about the same number right in the center of the convex portion of it.

CAPCOM Roger, Ron. We didn't copy your answer to the question about any bubbles in the lineal.

SC No, I didn't get to your question on that. In the lineal unit, there are no bubbles whatsoever.

CAPCOM Roger. Thank you.

SC There might have been very slight movement, as a matter of fact, I see just a very slight movement even now. The particles in there, they're still lined up in the Y Y direction, essentially. Although, it looks like some of them may have deviated from the front of the lineal unit back toward the center, toward the back of the lineal unit, as you call it. I missed your 2 minute

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SC start time there, but I can keep track of it here, so we'll start the DAC and I'll turn this to low at 245.

CAPCOM Okay, we've got a hac on it, Ron, if you started it, we started we started our clock.

SC Okay. You know, just for future reference, if we like to do things in OG and without jarring or jiggling, we want to make sure that the switch actuates with a minimum of pressure.

CAPCOM Roger, a good point.

END OF TAPE

SC Okay, that's just now starting to develop looks like circular cells great big ones. And then some of the bigger ones are subdividing now.

CAPCOM Okay, we got that.

SC Some of them are even getting bigger one of them is about three quarters of an inch in diameter. And it hasn't divided yet at all.

CAPCOM Those are real good comments, Ron, I was just talking with the experimenters and if you've got nothing else to do giving us some sizes of those cells would certainly be very beneficial.

SC Okay. Okay, frame 27 was taken at an elapsed time of about four minutes.

CAPCOM Okay, we've got that.

SC Stu, this is Jack I was taking the pictures. I took four pictures about 20 seconds apart - the sequence just after he started it. And that ended with - or started with frame 26.

CAPCOM Okay frame 26 for 4 seconds - I mean 4 frames.

SC Okay, that one cell I spoke of that was about three quarters of an inch in diameter is now about an inch long and maybe three quarters of an inch wide. Each - all of the cells seem to be bigger in general. Their bigger this time two small ones at about an eighth of an inch and along along one side. The other one is a half inch oh a quarter of an inch, an half inch and then a circular when you get around to the annulus of the cup. Then you start getting circular slides instead of straight sides. All of the flow comes from the little center spot and flows outward from the center toward the outside of the cells.

CAPCOM Okay.

SC This happens to all of the bubbles that disappeared except two.

CAPCOM Ron, is the smaller cell you see about an eighth of an inch across.

SC The smallest cell I see is a four sided one that looks like a diamond. And it's an eighth of an inch on one side and an eighth of an inch on the other side and maybe three sixteenths on the other two sides.

CAPCOM Okay that sounds - that's a good description, Ron. I know on mine some of the smaller ones didn't show up in the film and we were not sure what size they are so you might before you quit bracket the smallest or the biggest cells by your estimate of the size.

PAO This is Apollo control at 46 hours 10 minutes. Apollo 17 is 150 976 nautical miles from Earth

PAO traveling at a speed of 3 375 feet per second.

SC And the information for (garble) experiment - the orientation was 90 degrees from us (laughter). Lineal cell was on the right and the lineal cenl was in line with the X axis.

CAPCOM Okay, Ron, we got, we had a drop in on signals right there and we did get your last comment about the orientation. We missed some comment about the frame numbers, I think came from Jack.

SC Okay, somethings a little different on this one here. Right at the top of the low circle it looks just like a finger, it's a curved surface that goes out. It almost touches the, the circumference of the dish and it looks just like if you're holding your finger up and looking at it. It's that type of a shape to it. It comes back down and it's about a half inch wide, the flow again iminates from a source that is almost on the finger tip you might say.

CAPCOM Okay, we copy.

END OF TAPE

SC And Houston, did your listing or DSC if your listing? Had a little bit of felt loop, there's the end of film now. May as well stop it. Anyhow, I went to high for a little ways.

CAPCOM Okay, Ron. As you came back in, I didn't get all of that. Understand you ran out of film and say, the unit.

SC Well, I still had a little bit of film when the cool down period was less so I went back to high on the flow pattern just to see what would happen. And it looked like they were starting with again larger size cells developing into smaller ones. And initially, all of the cells were about a half inch in diameter. And they were closer to the periphery of the dish than they were in the low position.

CAPCOM Okay, we copy that, Ron.

CAPCOM After you went to high, after the 19 minutes, how long was it before you started seeing a change?

SC Ah, it was within a minute. See it cooled down pretty rapidly at the end of the 2 minutes, all of the cells had essentially dissolved. You had some radial lines on the outer perimeter of it, the cells were on the outer side, degraded into a strictly radial lines. Back to the second row of cells. The row of cells that were on the inside kinda joined together and all ended up into one or two large cells about an inch - about 3 - 3/4's of an inch across.

CAPCOM Okay. Sounds like real good data (garble)

END OF TAPE

SC I still have it in high and the pattern that's developed is almost identical to the - what was happening in low, except it seems to be happening in a faster rate.

CAPCOM Okay, we copy that.

SC Triangle or a little diamond developed down there and it disappeared. Only this time it kind of joined with a different little cell, but it was the same cell next to it. I still have the big one. It's about an inch long at 11 o'clock as I had before. I still have the finger it's developing about 12 o'clock and another one about 2 o'clock. And they seem to be migrating again toward the bottom of the dish.

CAPCOM Okay, Ron, it sounds like you really wanted that experiment in great shape, and all the - and everybody's real happy that the - with the data, I guess now you might as well tear it down and press ahead. Okay, Ron, we're back with you now and everybody's real happy with the data and experiment and looks like you did a super job and you might as well tear it down and press ahead.

SC Okay. I still got it in high. And I'm kind of sucking the fluid back down the intake, and as I get the fluid thinned out, low and behold, there's a whole bunch of bubbles underneath there. And each bubble is a source for one of those little cells. It's the internal source.

CAPCOM Okay, Ron. We got that. You may have made a break through for science.

SC (Laughter) Okay.

CAPCOM 17 Houston.

SC 17, go ahead.

CAPCOM Ron, just a reminder that we're scratching that page 3-45 that 46 to 47 that's scratched out and from then on all the times you just subtract an hour from it, if you haven't done that already.

SC Ah, let's see. Yeah, we've already done that, Bob, thank you.

CAPCOM Rog. Just a reminder on that and ECOM's over here trying to figure out if you changed the canister or not. Just a reminder on that one.

SC Okay. We'll get that as soon as I get this out of the way. Okay?

CAPCOM Sure. While you're back there panel 100 and that, you might part the optics, we see they're not in zero.

SC Okay.

CAPCOM And on that same line, Ron, we did notice several times while people were watching through the optics that they went to zero, and it's no problem if the rates are low, but just a reminder that we don't want bump them into the stops with any kind of a rate.

SC Yeah, I concur with that Bob. I guess I

SC didn't realize we were doing that.
CAPCOM We just picked up som data points down here
that people - you were all looking around, I guess and you might -
it's easy to miss that trunion going to zero I guess.
SC Houston, 17.
CAPCOM Go ahead, Jack, Gene.
SC I'm ready to update your weather in the western
Pacific if you're interested.
CAPCOM Roger. Go ahead.
SC Still can't quite figure out what that circulation
around New Zealand means. It looks like it's merging with some more
weather in the southeast. I suspect it's stormy there but I still
it's not a terribly well developed storm although it seems to be
broadening in its extent. Australia is completely free of any
significant weather and almost completely clear and free of
clouds. The - there appears to be a front - although right now
it does not look too intense, approaching from the southwest, and
it looks like it's about 5 degrees of longitude south of the
southwestern tip of Australia. The typhoon gerous Mr. Reese I
guess it is, appears to be just about the same position it was
yesterday. And that is north of Borneo, and between Viet Nam and
the Philippines.
CAPCOM Roger. We see that on the prog here, Jack.
SC Okay.

END OF TAPE

CAPCOM Jack, we've been out of COMM here if we've missed any of your last report here Ron, did you ever get your P23 data from today?

SC That's negative, never did.

CAPCOM Okay, just got some updating information for you if you want to listen to it. I don't think you need to copy it down.

SC Very good, sir, go ahead.

CAPCOM Okay, Ron, the effective horizon was 25 plus or minus 6 nautical miles which is real fine. The sub-stellar pointing error was 1 arc minute plus minus arc minute which is less than the 1 Sigma error. The marking data was extremely consistent and all techniques and procedures were excellent. And the horizon updates from the current onboard value was 28 - is not required, so you're extremely good P23's Outstanding.

SC Okay, that's good to hear. Great. Thank you.

CAPCOM And I do have one input from your other half. There's a concern that you spill grape juice on your flight suit it's hard to get out, so be sure and when you're eating - drinking grape juice you want to make sure you learn to drink it right.

SC Okay, we'll try that for sure.

PAO This is Apollo Control at 46 hours 46 minutes. The display which shows distance and velocity is referenced to the Moon at this time so these numbers I'm about to give you will be Moon referenced and not Earth referenced. Apollo 17 is 80 322 nautical miles from the Moon. Velocity 3 349 feet per second. The crew is in a meal period at this time and we don't expect much conversation for some time. Earlier today, while the Lunar Module was being checked out and during a test of simultaneous dual communications capability from Challenger and America, a portion of the conversation was lost due to a communication line configuration in the Public Affairs distribution system. We have now obtained tape of this lost conversation from the Air/Ground recorders in the Control Center and will play that for you now.

SC (garble) even getting - (garble) any scratching on here now. (Garble).

END OF TAPE

SC (garbled)

CAPCOM Ron, this is Houston. We'd like to confirm the tunnel index angle - that's a positive plus 1.2, is that right?

SC Standby, I don't believe it yet. I want to check it myself. Yeah, Gordo, that's what I read but I figure it's his privilege.

SC I was checking for any scratches on the drogue but it doesn't look like there is any on there.

CAPCOM Roger.

SC See (garbled) - (humming - la de da etc)

SC Okay, Houston. The roll dockings index is on a 1.2 - a plus - 1. - a plus. 1.2.

CAPCOM Roger. Plus 1.2.

SC And - let's take a look up there in the docking latch number 4. The bungee is parallel - Roger - bungee is parallel but its not fully extended. You look down in the end of it and - you know - and its not fully extended. And - and the - capture - the docking latch itself or the docking lever is loose on the docking ring. So, its looks like to me that's when I ought to recock and fire it again.

CAPCOM Okay, we copy that, Ron. Stand by.

CAPCOM Ron, can you estimate in inches how far down the bungee pistonis?

SC Yeah, its down about a half an inch.

CAPCOM Roger.

SC And - a - when I take the - and move the handle back a ways and I can take the - hook - there I did it ... I took the hook and I pulled it back off the docking ring and then it caught again, so now it won't go back over the docking ring. Maybe - I just lifted the hook off the docking ring with my finger.

CAPCOM Roger.

SC (garbled).

CAPCOM Say, Ron, I would like to caution you again, sticking your finger around or under that hook - there may still be some spring energy stored up there that could release.

SC Oh, you betcha. Yeah, I know that. No, I was just touching the top of the hook when I pulled it back off the docking ring.

SC I'll pulling back onto the docking ring and it looks like its back in the cocked position now.

CAPCOM Okay, I think we've got the picture.

SC Do you want me to open the hatch here, Jack, or do you want to - while they're thinking about that I'll get out of the way and come on and open the hatch.

SC (laughter) Can't get up and can't get down. - Okay. -

CAPCOM We're having a long conversation about that latch Ron, why don't you all just press on down the checklist and leave it as it is, while we think about it?

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SC Okay, that's what we're doing here, Gordo.
SC Okay, Gordo, do you want the O2 heaters
1 and 2 off and 3 auto? That's what you've got.
CAPCOM Yeah, that's fine.
SC Okay, he's going to open the hatch and
IVT. Gordo, let me tell you a little more on that docking
latch. When I looked at it, of course my handle was flush
against the edge and it was also - essentially - locked in position.
But since the bungee was down on the thing I took hold of it
and I felt that the hook itself was loose. Okay, so I took
the handle and the handle will come back- would come back once
you pressed the little button you know to release the
handle. The handle would come back to about a 45 degree
position just like it normally does when you try to cock the
latches. Okay, with the handle back in that 45 degree position,
then I grabbed hold of the hook and brought the hook off of
the docking ring with my finger and back to about that
45 degree position again just like it was comparable to the
first cocked position. And that's the way it is right now.
CAPCOM Okay, Ron.

END OF TAPE

SC Okay, one piece of tape coming up shortly, provided I can find the tape. Ah, here it is. Okay, Gordo, I'm running up through the tunnel from America to Challenger.

CAPCOM Roger.

SC Piece of tape coming up. I'll tell you, Gordo, it's remarkably clean up here. It doesn't look likee snow storm that I remember coming into last time.

CAPCOM Rog, understand.

(garble)

SC (garble) up here. Hey, you did a good job, friend. Hey, that's good, where is it? Oh, you you can see it! Is it straight out there? Let me see, I want to see. I want to take a look at it, too. Hey, there it is, sticking straight out. Okay, Houston, America has a VHF antenna - looks deployed perfectly.

CAPCOM Roger.

SC Hey, you guys are upside down in there. (Laughter). The commander's window has a slight amount of condensation on the lower left edge - that's the lefthand edge, really. It seems to be just there as the sun warms the window.

CAPCOM Roger, Jack.

SC Okay, Houston, 74 on 1-3.

CAPCOM Okay.

SC Geez, what was that? What was that from? What the hell is this?

CAPCOM Sounds like the cabin (garble) is working okay.

SC Holy smoly. Did the heart beat go up on that. (Laughter). Sun's out - there's sun out in the AOT.

CAPCOM Roger, Jack.

SC Okay, I'm looking out the "V" and I see a VHF antenna and part of a umbra radar antenna in position one. Position two looks right in the radar antenna and, as I said yesterday, it was beautiful.

CAPCOM Roger.

SC Position three, I see the other side of America and very, very clean air, very clean. Okay, I got a good view of the side of the service module and you can see these little blisters in the side of the covering there quite distinctly. I think people were talking about those before.

CAPCOM Rog.

SC Yeah, I take that back. That's the side of - that's the side of the command module we're looking at that has the little blisters on it. Got to get oriented up here. Got a great view of the hatch - you (garble) - watch your eyes and everything. Look up rather than into - the sun is in the lower portion - -

END OF TAPE

SPEAKER Okay, step one on one dash four.
SC Okay, Gordie, the LMP OPS is 6100 psi,
6100.
CAPCOM Roger.
SC And the CDR OPS is 5900, that's five
nine zero zero.
CAPCOM Okay.
SC Okay, zip bag coming up.
SC You wont scare me any more if I come on
up here with you, will you? (Laughter).
SC I gotta go back in there.
SC Okay.
SC Okay, do you want to stack part of it over
there.
SC No, wait a minute, there's strips of the
stuff you know, I'll just give you a strip of it, take it
over there.
SC Okay, here you go. That's 9 of them, is
that enough?
SC Yeah, go ahead, Jack. Yeah, in the tunnel,
what do you need?
SC Okay, don't wait on me.
SC Okay.
SC Checking circuit breakers now, Gordie.
CAPCOM Roger.
SC (Garble) both circuit breaker panels
were as advertised, Gordie.
CAPCOM Okay.
PAO This is Apollo Control at 47 hours - -

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/8/72 CST 22:52 GET 47:19 MC 217/1

PAO This is Apollo Control at 47 hours 18 minutes. That completes the tape from this afternoon. At this time Apollo 17 is 79 293 nautical miles from the Moon. With the lunar referenced velocity of 3343 feet per second. The flight director has just gotten another update on the S-IVB impact prediction, based on tracking to date. The newest prediction is that the impact will occur at an elapsed time of 86 hours 59 minutes 55 seconds, at 3 degrees 58 minutes south latitude, 12 degrees 35 minutes west longitude. While that tape was playing, there were several conversations with the crew. Including one between Brigadier General Tom Stafford and Gene Cernan. Stafford was Cernan's spacecraft commander in both Gemini and Apollo. We'll play those conversations for you now and then come back up live.

SC Houston, 17.

CAPCOM Go ahead. 17 Houston, go ahead.

SC I need to make a correction. Roger, I need to make a correction. It looks as if that storm area that was in New Zealand yesterday has moved up across the two islands and is now sitting northwest. It's getting a little hard to identify the smaller islands in the Pacific but pretty sure I've got it in the right place now looking at the map. And it is northwest of New Zealand and it looks like New Zealand is probably having reasonably good weather today, although I suspect it rained last night.

CAPCOM Roger, Jack. That's interesting because on my prog it doesn't show a thing down that area. It just may not be up to date here yet.

SC Well, there may be nothing down there except some cloud patterns and - but that's all I can see of course. The front that's south of Australia now, I presume front, just looking at a fairly well developed - although narrow cloud line, is about by about 10 degrees south of Perth right now, southwest of Perth, and runs on a northwest-southeast line over to a point about 10 or 15 degrees southwest of Tasmania. And then it intersects a curved front that runs from there up to Tasmania, and then back around down south of New Zealand about 10 degrees.

CAPCOM Roger, Jack.

SC Say, Bob, this is Gene. I got some new sensors on you might want to take a look at them.

CAPCOM Roger, good show Gene. We were just wondering about that and I'll let you guys on my left here make sure looking at them. We're not getting any data yet, Gene.

SC (Garble) we're starting to get - from - just off Luzon on a northeast trend (garble) seen so far a shadow line of very thick high clouds overlying some thick lower clouds behind the front.

CAPCOM Roger. You might have - be of interest on board there the FIDO. Jack we've been COMM drop out there on this OMNI if you swing around on it.

SC Okay, where did I leave you, Bob?

CAPCOM Well, I'm not sure because we picked up a number of different bits and then we dropped it all.

SC Did you get the overcast over Korea-Manchuria bit?

CAPCOM Negative, I didn't get that.

SC Okay. That generally - south China looks clear. I haven't had a real good look at it yet it's out on the LM, It's clearly however, overcast over Korea and Manchuria. It does not appear to be frontal weather there though. The dominant front in the northwestern Pacific stretches on a northwest line from just off Luzon on up as far as I can see to determinater. And it seems to be an extremely strong front with what I would guess is heavy air-mass weather all along it and up to the east-northeast of Japan there's an excellent example of a shadow line from some very thick high clouds on solid overcast of lower clouds. Don't see any major cyclone development along it or wave development. It just looks like a very strong air-mass front.

CAPCOM Roger, Jack, we've got it on our prog here. We don't see the one on the northeast part of Japan but, we do show a front prog for tomorrow morning going off from Taiwan and to the right of Taiwan eastward, pass the Ryukyu Island and just on into the northern Pacific there. Looks like pretty heavy cloud mass there.

SC Roger, that's the one I'm - Roger, that's the one I'm looking at and it's extremely heavy and right now it's - in fact it starts about in Luzon and looks like Taiwan is almost on the back side of it.

CAPCOM Yeah. That's what our prog - it shows it right on Luzon and Taiwan's clear.

SC Very good.

CAPCOM We'll keep up with you yet there, Jack. Say, you may be interested. We've got 9 hours of good tracking on the - after the midcourse and we show a perilune of about 52 miles which confirms a good midcourse.

SC Sounds outstanding. That's great, you can cross off the canister by the way, it's changed.

CAPCOM Okay, EECOM's happy about that now finally. And (garble) your data looks good.

SC Okay. I never had a chance to tell you, Bob, but you - as you see - I presume I - the LMV no longer had sensors on.

CAPCOM Roger. We confirm that.

SC By the way, those were the - as you know the sensors that we put on at the Cape, and they still seem to be in good shape when I took them off. I figured I'd let things rest a while and then I'll put them on again tomorrow.

APOLLO 17 MISSION COMMENTARY 12/8/72 CST 22:52 GET 47:19 MC 217/3

CAPCOM Roger. Looks like you've got eat period
scheduled here for an hour and then into the pre-sleep checklist.

SC Whoopee, the old pre-sleep checklist.

CAPCOM Apollo 17, Houston.

SC Go ahead, TP.

CAPCOM Yeah, I was going to say is that talkative
commander on board.

SC How are you doing down there?

CAPCOM Well, I feel a lots better. Like I told you,
Gene, on - I think you're the jinx on Gemini 9 for all the
delays. Over.

END OF TAPE

SC No way, you got a longer history than I do.
CAPCOM Everything's looking great.
SC Yeah, it's looking good on board. We're -
I think we're pretty well squared away. We've got our stowage
in shape and we're in the housecleaning routine and that's about
fifty percent of the battle.
CAPCOM Right.
SC The weather down there didn't look too good
today. How's it been?
CAPCOM Well, when it started out, it was below
minimums this morning and finally, this afternoon, it cleared
up, but it was strictly zilch this morning and starting last
night. There's another front due in here later tonight.
SC Yeah, we've been watching that one.
CAPCOM Well, Jack, you're turning into a trained
weather observer besides being a geologist.
SC Oh, I'm enjoying it immensely, Tom, as you
may have gathered.
CAPCOM Right.
SC Very interesting place to watch, I'll tell
you.
CAPCOM Absolutely superb.
SC How are things on the home front, TP?
CAPCOM Well, Gene-o, things couldn't be better.
SC Yeah, well, you might pass on all the good
word from us.
CAPCOM Oh, yeah, will do. I plan to drop by and
bum a cup of coffee tomorrow.
SC I'd love to invite you up here for supper.
CAPCOM I wish I could join you. I could make
another couple of remarks but they'd be X-rated, so I shouldn't.
SC Okay, I'll accept that. Do you notice I
haven't, yet.
CAPCOM I'm very well pleased, Gene-o. Your language
is superb. 17, Houston, just a couple of words. We'd like you
to know we're real satisfied with all the LM data that we saw
during the LM activation work today, and, looking at it, the
data looked real good.
SC Great, Bob. You had me worried there for
awhile with that COMM. Do you have a good idea what caused that?
CAPCOM Yeah, we're sure about 99.9 percent it was
just ground linkup.
SC Yeah, that's certainly the way it acted on
board.
CAPCOM I guess there won't be any need to go back
and change the checklist on that but there's a lot to be said
for maybe going to a real good stable condition and getting a

APOLLO 17 MISSION COMMENTARY 12/8/72 GET 47:27 CST 23:02 MC 218/2

good firm checkout before you go into that down voice backup mode and things like that, and I think that's what we'd do in the future.

PAO This is Apollo Control. We're back live now with Air/Ground - -

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/8/72 CST 23:06 GET 47:31 MC 219/1

SC Houston, 17.

CAPCOM Go ahead, Jack.

SC Say, I'm just a little curious about the difficulty on holding the OMNIs, is that about the same as past missions or are we loosing a little bit more than usual.

CAPCOM We're going to have Ed here give us a discription for a minute so let me stand by.

SC Okay.

CAPCOM Jack, according to that - to starward INCO over there, due to this new 210 down at Tin Bin Billa, we are holding actually longer than the past history.

SC Okay, I just guess I've never been on this end before.

CAPCOM Roger. Do you hear it on board when we break like that.

SC Yes, matter of fact with our squelch enabled we loose all the background noise and we know when we're picking you up because we start to get background noise again.

CAPCOM Roger, in other words you are able to stop talking or something when when you know we're breaking like that?

SC Well, if we haven't been talking we'd break lock, no unless we're watching the meter we want, we loose you when you get about 55 say 60 percent signal strength and apparently we're not talking to you when we have less than that.

CAPCOM Roger. Yeah, INCO gave me a briefing tonight and showed me what chart to watch so I can look at numbers when to talk, I've been talking myself to much lately.

SC Yeah, they have a beautiful chart there for that purpose.

CAPCOM I never really wanted to be an INCO BUT I guess I was forced to tonight.

SC Comment for that one, Bob, but I better

END OF TAPE

SC There are lots of comments for that one, Bob,
but I'd better not say anything.

CAPCOM Roger.

SC You'd never speak to me again.

CAPCOM Well, that's all right. We can't X rate
the transcripts so we'll just have to take it easy.

SC Say, Bob, I've got another question about
the Challenger.

CAPCOM Go ahead, sir.

SC Yes sir. The battery voltage on low taps
- strangely enough was just like the simulator but I had ex-
pected that the simulator might have been wrong - that we
would have seen higher voltage there. Is that about what
you guys expected?

CAPCOM Roger, they said they expected that because
the extra time on the pad that they're running. That 2 hour
40 minute delay is coming into play again.

SC Oh, yeah, yeah. That's right. Good. I
forgot all about that. Something made that slip my mind.

CAPCOM Well, things have been going so well that
I can't blame you for forgetting that.

SC That Stanley Holloway's crazy flight plan updates
that we've just forgotten we were that late.

CAPCOM Roger. Say, by the way, we like the
music in the background - sounds pretty good.

SC Yeah, we sort of - we didn't get it out
at all until today. I don't know whether we forgot about
it or too many other learning things going on. It's quite
pleasant.

CAPCOM Rog. I don't think you forgot about it.
I think you were just glued to those windows.

SC Well, I still am as a matter of fact.
The old Earth's coming by and say, I mentioned a couple of
fronts that joined together about 20 degrees south of - of -
the south coast of Australia - and it looks like that's a
fairly healthy storm center developing down in there, con-
ceivably may migrate up across Tasmania and may be up - up
the Sidney - Brisbane coastal area in the next few days.

CAPCOM Roger. Where is the exact center of
that Jack? It took me a second to get my prog out here.

SC Just a second, let me give you better
info from the map.

CAPCOM Roger. While you're looking at your map, I
just might mention to Gene, I just talked to your better half
over there and everybody's fine and happy.

SC Great. Always like to hear news like
that, Bob.

CAPCOM Roger.

SC Bob, did you get that - 15 to 20 degrees
south, southwest of Adelaide.

CAPCOM Roger.

APOLLO 17 MISSION COMMENTARY 12/8/72 2322 CST 47:48 GET MC 220/2

CAPCOM 17, Houston. Are you into your pre -
CAPCOM 17, Houston. Are you into your presleep
checklist yet?
CAPCOM 17, Houston. Are you into you pre-sleep
checklist now?
SC We're just about ready to get started, Bob.
We're running a little bit behind, but - we'll catch up here.
CAPCOM Okay. No sweat.
SC Trying to get some more of this good food
down.
CAPCOM Roger. Keep saying those words. The
people on my left appreciate that.
SC Yeah, but it does take a while.
CAPCOM I'm sure of that.
SC You know, what we really need is Rita to
fix it for us.
CAPCOM That's affirmed. I'll go along on that.
SC Okay, Bob, I'm going to cycle H2 fans
1 and 2.
CAPCOM Okay, we're watching.
SC Fans are off.
CAPCOM Roger.
SC Bob, we're still on November, November -
frame 140 and I'm going to take 2 more pictures before I go
to sleep.
CAPCOM Roger, Jack. We copy that. November,
November - frame 140. And you ought to be on 142 when you
go to sleep, I guess, huh?
SC That's affirmed.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/8/72 GET 48:03 CST 23:36 MC 221/1

PAO This is Apollo Control at 48 hours 9 minutes. Apollo 17 now 77 623 nautical miles away from the Moon and the lunar referenced velocity 3 333 feet per second. Here in the Control Room, flight director Gene Kranz and his white team are preparing to relieve the orange team which has been directed tonight by flight director Chuck Lewis. Major activities during this shift have been the heat flow and convection demonstration which has been performed twice during this shift. Once, while the spacecraft was nulled in all three axes and again after the passive thermal control spinup mode had been established. That demonstration is to provide data on behavior of fluids in a low gravity field and the information learned from the demonstration could be valuable in the future science experiments and perhaps for manufacturing processes in space. The crew is in its pre-sleep checklist at the present time and we have a - again a new update on the S-IVB impact just provided by the flight dynamics officer updates impact time to 86 hours 59 minutes 38 seconds at 3 degrees 37 minutes south latitude, 12 degrees 7 minutes west longitude. We do not anticipate a change of shift briefing at the end of this shift. Handover is scheduled for midnight and there will be no change of shift briefing. At 48 hours 12 minutes this is Mission Control Houston.

END OF TAPE

SC Houston, 17.
CAPCOM Go ahead.
SC Roger, one final word, I got those pictures and I tell you that typhoon off - north of Barneo, looks like it's right off the coast of - the east coast of Viet Nam now and it's about as tightly organized and solid as anything I can remember seeing in photographs. It looks as if, from yesterday, it's moved quiet a bit to the west.
CAPCOM Roger, we concur the prog for 12:00, let's see that's about 6 hours from now. Shows it to be right over the Viet Nam area, the Viet Nam Peninsula there, so looks like it's moving the way they are progging it, huh.
SC Yeah, it certainly is. It's moved from just a little bit west of Luzon over to the coast there so it's a pretty healthy storm.
CAPCOM Roger. It looks on the prog chart here it looks real tight, it's a very - very centralized thing in a real tight circular.
SC Oh yeah, you better believe it, it is really, it is tight, it's really no bigger than the, in terms of cloud pattern, no bigger than the - say South Viet Nam itself.
CAPCOM Roger. How're you getting that, Jack, are you looking with the monocular now?
SC That's affirm. Monocular still gives real good resolution on the cloud patterns. Naked eye you just see the masses, but with the 10 power monocular it's perfectly adequate for seeing the kind of patterns we're talking about.
CAPCOM Roger. I understand. Well, guys, I guess I wont get the chance to say goodnight to you because Parker's going to come in to put you to bed.
SC Heavens.
CAPCOM And we'd like you to clear DESKY if you will.
SC Say goodnight, Bob.
CAPCOM Say goodnight, Dick, huh. One last word, you know we're always hounding you guys, really don't mean to, but we'd like to see you clear DESKY so something doesn't burn out, don't know the exact words on that, but -
SC Okay, we'll give you a clear DESKY.
CAPCOM Roger.
SC Goodnight, Robert.
CAPCOM We'll see you tomorrow, troupes and we had a good show today and we'll have more tomorrow.
SC Ron says goodnight, Bob.
CAPCOM Roger.
SC Robert Parker, are you there.
CAPCOM That's affirmative.
SC Bob, you're just in time to put us to sleep and I'll give you one last little ole observation here. Extremely bright zero base point right off the northwestern corner of Australia right at Carnarvon, it's bright as I've seen. They must have a pretty good surf or something going there.

CAPCOM Okay, that sounds good.

CAPCOM Okay, 17, we copy all that and I gather you're going to sleep at this point.

SC Well, we're going to try, Bob, I don't think any of us are real sleepy right now, but, we're going to give 'er the old space try, here, and I'm sure we'll be a sleep before long. Ron is on watch and if you don't wake him up with your voice give him a crew alert, he says he'll wake up with the master alarm.

CAPCOM That's a healthy sign. All right, guys, if I stick around long enough in the morning I'll wake you up.

SC Okay, Robert, are you happy with you're antenna configuration?

CAPCOM That's affirm INCO is happy.

SC Okay, you have anything else for us, I'll take care of our sleep configuration if you don't.

CAPCOM Okay, stand by, I'll go around the MOCR here with white.

SC (Laughter)

CAPCOM Okay, lot of happy people down here with nothing to ask you.

SC Okay, nice to have everybody happy, and that includes the Biomed on the Commander, huh.

CAPCOM Okay, I guess they are happy.

SC Okay, are you going to sing to Ron in the morning to wake us up?

CAPCOM Depends on how soon you guys decide to wake up in the morning. I'll be around for 8 hours any way.

SC What's your expected GET of awake.

CAPCOM Stand by. Okay, 17, I should say -

SC (Garble)

CAPCOM Go ahead.

SC Yeah, we're just going to say the same thing.

CAPCOM Okay, show 56 on your clock. In fact, Dr. Kranz here, just decided that you guys get another half hour in the morning if you wanted it. You better tell us now 'cause we'll wake you up at 56 and ask you if you want the other half hour then, unless you tell us.

SC Yeah, why don't you give us another half hour and if we happen to wake up and want to move around, well, we'll do it.

CAPCOM Okay, we'll wake you up at 56:30.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/9/72 GET 48:36 CST 0010 MC 223/1

SC Yeah, why don't you give us another half hour and if we happen to wake up and want to move around a little, we'll do it.

CAPCOM Okay, we'll wake you up at 6 or 6:30.

PAO This is Apollo Control at 48 hours 39 minutes. We now have turned off the voice subcarrier up to the spacecraft and INCO just a few minutes ago reported that the crew has also turned off the voice subcarrier from the spacecraft, indicating that they have completed their presleep preparations and should begin scheduled 8 hour rest period shortly. Spacecraft Communicator, at the present time, is astronaut Robert Parker. He has replaced Robert Overmyer in that position and in Mission Control we're set to maintain the watch while the crew is sleeping, keeping an eye on spacecraft systems via telemetry. Apollo 17 is now 76 630 nautical miles from the Moon and everything appears to be functioning normally aboard the spacecraft at this time. At 48 hours 40 minutes this is Apollo Control Houston.

END OF TAPE

PAO At the present time in Mission Control, Flight Director Gene Kranz is going around the room polling each of his Flight Controllers on the mission status and all the reports are coming up very good. The orbital science officer said that the temperatures in the SIMBAY where the various scientific instruments will be used in Lunar orbit to observe the Moon from orbit appear to be about as would be expected at this time. During the previous shift the film in the panoramic and mapping cameras was cycled and this is done once every 24 hours if the cameras are not used, to prevent the pressure points on the film in the transport mechanism from creating striations in the film emulsion, and those cameras are cycled ahead several frames to move that pressure point around on the film emulsion. During Lunar module house-keeping when the crew entered the LM on the previous shift, everything looked to be in order in that vehicle. And the guidance and control officer reports that the midcourse correction maneuver performed earlier in the day - was very close to nominal. Also, the command module is running a bit ahead of the flight plan schedule as far as reaction control system propellant usage and service propulsion system propellant usage and we have a bit more than predicted for this point in the flight. And the Electrical Environmental Communications Officer, EECOM, said that in general the command module - the command and service module appear to be in very good shape. Apollo 17, at this time, is 75 975 nautical miles from the Moon and we're showing a velocity with respect to the Moon of 3325 feet per second. We don't anticipate any further conversation with the crew, having said "goodnight" to them - and we are planning to give them an additional 30 minutes on their rest period if they so desire. The rest period, according to the flight plan, is scheduled to end at a ground elapsed time of 56 hours. However, we do not plan to put in a call to the crew until 56 hours 30 minutes, giving them the option to sleep an additional 30 minutes if they so desire. We showed at 48 hours 38 minutes, or about 23 minutes ago, that they had turned off the voice sub-carriers indicating that they were preparing to bed down and get to sleep. During this sleep shift we'll plan to have the air-to-ground lines down to minimize the amount of noise on these circuits. we'll be recording any conversation with the crew and will be prepared to bring the lines up in very short order should we have any calls from the crew. At 49 hours 2 minutes, this is Apollo Control, Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/9/72 GET 49:57 CST 0130 MC 225/1

PAO This is Apollo Control at 49 hours 57 minutes. It's been nearly an hour and a half since we said goodnight to the crew and there's been no change in the status of the spacecraft or operations here in the Control Center. Everything's progressing along very smoothly at this point. We don't expect to put in a call to the crew until 56 hours 30 minutes ground elapsed time or about 6 and a half hours from now. Apollo 17 is now 74 098 nautical miles from the Moon and the spacecraft velocity is 3 317 feet per second with respect to the Moon. The flight dynamics officer has the option of setting up the display which gives us the velocity of the spacecraft and its distance relative to either the Moon or the Earth. His option is to look at the spacecraft position and velocity with respect to the Moon or to Earth. At the present time, we are looking at those parameters with respect to the Moon. The large display plot up on the large 10 by 20 foot describing plotter display at the front of the Control Center shows us that the spacecraft is now approaching 160 000 nautical miles from Earth. At 49 hours 59 minutes this is Apollo Control Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/9/72 0320 CST 5058 GET MC-226/1

PAO This is Apollo Control at 50 hours 58 minutes. The crew has been in a rest period now for about 2 1/2 hours. The Flight Surgeon has had bio-medical data on the Commander, Gene Cernan. It indicates that at least Cernan is soundly asleep at this time and we presume that all 3 crew members are sleeping. Wake up call is scheduled for 56 hours 30 minutes or about 5 and a half hours from now. Apollo 17, currently 160 762 nautical miles from Earth and we're showing the spacecraft 72 200 miles from the Moon and its continued to be very quiet in Mission Control, almost no conversation on the loops here and no change in any of the systems aboard the spacecraft - everything going along very smoothly and performing well at this time. The cabin temperature at the point we monitor it, that's where our telemetry which is the outlet of the air flowing into the cabin, shows the temperature at that point to be about 63 degrees. The cabin temperature itself would be somewhat warmer than that, probably up around room temperature - 68, 69, 70 degrees - in that area. At 50 hours 59 minutes, this is Apollo Control, Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/9/72 0330 CST 5158 GET MC-227/1

PAO This is Apollo Control at 51 hours 57 minutes. We've had no signs of any activities from the Spacecraft and it appears that the crew is sleeping at this time. Apollo 17 some 70 200 nautical miles from the Moon. And we have a clock counting down to the time at which the crew is scheduled to awake - some 4 hours from now. Actually, that would be the earliest that we would expect to hear from them and prior to beginning the rest period we advised them that we would not plan to put in a call until about 30 minutes later than called for in the flight plan. They were about a half hour late getting the rest period. Tomorrow's schedule is relatively uncluttered and Flight Director, Gene Kranz, decided to give them the extra 30 minutes of sleep if they desire to take it. On awakening the - one of the main activities in the flight plan for today has the crew re-entering the lunar module, Challenger and partially powering the vehicle up and running some additional checks. And there has been no change in the status of the spacecraft based on the telemetry information we're getting here in Mission Control - everything continues to perk along very smoothly. At 51 hours 59 minutes, this is Apollo Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/9/72 CST 4:30 GET 52:57 MC 228/1

PAO This is Apollo control at 52 hours 57 minutes. We're now midway through a scheduled 8 hour crew sleep period. And it continues to be very quite here in mission control. No signs of activity aboard the spacecraft, and everything going along very smoothly. The flight dynamics officer has been working on the trajectory, and looking at tracking data as a result of the midcourse correction performed yesterday. And at this point it appears that no further midcourse maneuvers will be required to get Apollo fif - Apollo 17 into lunar orbit at the desired altitude and time. However, the flight dynamics officer is going to reserve final decision on that point probably until tomorrow. Although it does appear certain at this point that there will be no midcourse correction required at the midcourse correction three opportunity. And probably not even at midcourse correction four. Our data displays at this time show Apollo 17 68 237 nautical miles from the Moon. And on a different display we're reading 165 584 nautical miles back to Earth. At 52 hours 59 minutes this is Apollo control Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/9/72 CST 0530 GET 53:57 MC 229/1

PAO This is Apollo Control at 53 hours 57 minutes continuing very quiet at Mission Control. Now about two and one half hours remaining in the crew sleep period. The flight plan calls for the sleep period to end at 56 hours Ground Elapsed Time, however, we don't plan to give them a call until 56:30, giving them the option to sleep for an additional 30 minutes. Apollo 17 now 167 000 nautical miles from Earth and we are showing velocity with respect to the Moon at 3 293 feet per second, some 66 300 nautical miles from the Moon at this time. This is Apollo Control at 53 hours 58 minutes.

END OF TAPE

PAO This is Apollo Control at 54 hours 57 minutes, some 1 hour 33 minutes now from the scheduled crew awakening time. What has been a very uneventful sleep shift for the crew and a very quiet period here in Mission Control. After the crew awakes, one of the activities on their schedule for the day will be to update the clocks for the spacecraft, we'll be updating the clocks here in Mission Control at the same time. This clock update is occasioned by the fact that we lifted off 2 hours 40 minutes late from Cape Kennedy, however, in order to place the spacecraft in lunar orbit at the same diurnal time or the same Sun time, and retain the lighting conditions desired for the lunar landing, the translunar injection burn was given a slight bit longer burn - just a little bit more energy put into that burn - trip time to the Moon decreased by 2 hours and 40 minutes. The net effect of this is that we now arrive at the Moon at the same time that we would have arrived had the liftoff been on time. One other effect is that the crew has a net 2 hours and 40 minutes less time to accomplish those things that needed to be accomplished in the translunar coast. This is of small consequence because the translunar coast time is relatively a slack period for them, however, in order to avoid any sudden shift in sleep periods and that sort of thing, the time has been made up in two increments - the first one of 1 hour at 45 hours in the flight plan. The crew activities were jumped ahead by 1 hour and they essentially began doing those things that were called for 1 hour later in the flight plan. They will again jump ahead an hour and 40 minutes and that'll occur at 65 hours. By that time they will have completed all those activities required up through 67 hours 40 minutes in the flight plan. Or, in other words, they'll have completed all of the activities required to get them into lunar orbit 2 hours and 40 minutes early and in order to make the clocks then agree with where the crew will be in the flight plan, we'll jump the clocks ahead 2 hours and 40 minutes. This clock update which can be likened to going on daylight saving time, only 2 hours and 40 minutes worth of change instead of 1 hour of change as we do on daylight savings time, will occur at 65 hours when the crew will have completed all of those flight plan activities up through 67 hours and 40 minutes. This simply involves setting our clocks at 65 hours in the Control Center and aboard the spacecraft at 65 hours, moving them ahead to 67 hours 40 minutes. Then, barring any further changes in the mission timeline from that point on, the elapsed time clocks which are used as the cue to flight plan activities, should agree with the flight plan and events that - in the flight plan are called out for a certain time will happen at that time on the elapsed time clocks in Mission Control and aboard the

APOLLO 17 MISSION COMMENTARY 12/9/72 GET 54:51 CST 0630 MC 230/2

spacecraft. This is a convenience factor. The other alternative would be to go through the flight plan and change all of the flight plan times to agree with the clocks. We simply find it easier to change the clocks and avoid having to make all those updates to the flight plan. At the present time, Apollo 17 is 64 232 nautical miles from the Moon and we're showing 169 518 nautical miles from Earth. Spacecraft velocity at the present time, again with respect to the Moon, is 3289 feet per second. And we are now 1 hour 27 minutes away from the time at which we anticipate the crew will be awakening. At 55 hours 3 minutes this is Apollo Control Houston.

END OF TAPE

PAO This is Apollo Control at 55 hours 57 minutes. We're about 30 minutes away from the scheduled crew awakening time. And we've seen no signs of activity aboard the spacecraft at this point, however, we could hear from the crew almost any time between now and the next 30 minutes. And if we haven't heard from them within about 30 minutes we'll be putting in a call - a wake up call to the crew. Here in the control center the next team of flight controllers beginning to come on duty. Flight director, Neil Hutchinson, will be relieving flight director, Gene Kranz. And the spacecraft communicator on the upcoming shift is to be astronaut Gordon Fullerton. He'll be replacing CAPCOM, Bob Parker. Apollo 17, at this time, is 62 thousand 415 nautical miles from the moon and traveling at a speed of some 3 thousand 280 feet per second and we show a range to Earth now of 170 thousand 6 hundred 50 nautical miles. We'll bring up the lines and monitor lines at this point for any call from the crew. At 55 hours 59 minutes this is Apollo Control, Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/9/72 CST 7:32 GET 55:59 MC-232/1

PAO This is Apollo Control, we're getting ready to wake up the crew. Bringing up to the voice circuits in the network at 56 hours 29 minutes, almost 30 minutes. Timing out to wakeup zero mark. We're waiting for the spacecraft to rotate through the next best OMNI antenna, before we make the wakeup call.

(Wakeup Music).

CAPCOM Good morning, Apollo 17, it's Houston, over.

PAO Apparently the crew has not turned on the downlink on their transmitter. That was the University of Kansas J-Hawk Fight Song, which is Ron Evans Alma Mater.

CAPCOM Apollo 17, Houston. Good morning.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/9/72 CST 8:11 GET 56:38 233/1

CAPCOM Apollo 17, Houston. Good morning.

CAPCOM Apollo 17, this is Houston. Good morning.

CAPCOM Apollo 17, Houston. Good morning.

PAO This is Apollo Control. We're going to try one more time with the Jayhawk Fight song and see if we can get them to turn on the transmitter. 56:45 ground elapsed time standing by. Here we go. (Jayhawk Fight song)

CAPCOM Apollo 17, Houston. Good morning.

Are you with us this morning?

PAO As they say in the entertainment music business, one more time. We're going to send crew alert and when we see the voice up carrier up we're going to roll the tape again, the Jayhawk Fight song. The crew is very sleepy this morning or else they have their volume turned down where they can't hear the music. At 56:49 standing by, this is Apollo Control.

END OF TAPE

PAO We are now sending crew alert. Gene Cernan's pulse rate still at about 49 which indicates the klaxon didn't wake him up. No indication yet that the spacecraft transmitter's has been turned on.

PAO This is Apollo Control. Apparently the crew either does not have their volume turned up enough to hear the calls from the ground or perhaps the ear plug has slipped out of the ear of the crewman who's to monitor last night which I understand was Evans. Therefore, about every 10 minutes the Capcom is going to give a wake up call to the crew again in an attempt to raise them. Spacecraft Communicator Bob Parker is - has unplugged from the Capcom Console and is being replaced by Gordo Fullerton. And when we see on telemetry that the voice subcarrier from the spacecraft has been turned on, we'll play the old fight song again: Jayhawk Fight Song, University of Kansas. And, eventually we may get these sleepheads awake. At 56:58 ground elapsed time, Apollo 17 is 60 471 nautical miles out from the Moon, approaching at a velocity of 3 285 and our slant range in nautical miles from the Earth to the spacecraft is 171 985 nautical miles. Standing by at 56:58, this is Apollo Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/9/72 08:32 CST 56:59 GET MC235/1

CAPCOM Good morning Apollo 17. It's time to
rise and shine. Over.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/9/72 CST 08:44 GET 57:11 MC-236/1

PAO This is Apollo Control at 57 hours 22 minutes ground elapsed time. The crew is still asleep. Have been unable to raise them until now. They're considering using an oscillator passed directly into the air-to-ground circuit to put a high-pitched tone, that perhaps even with the earplug out they would be able to hear it from a fairly good distance. Presently, Apollo 17 is 59 682 nautical miles out from the Moon approaching at a velocity of 3285 feet per second. Mother Earth is behind them some 172 562 nautical miles. Here goes another call.

CAPCOM 17, it's morning, time to get up. Over.

CAPCOM Hello Apollo 17, do you read? Over.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/9/72 09:02 CST 57:29 GET MC237/1

CAPCOM Here goes the tone up on the air-ground
circuit from network. (Music - Kansas fight song).

CAPCOM Hello 17. Hello 17. How do you read
us this morning?

SC We're asleep.

CAPCOM That's the understatement of the year.

SC Never let Evans be on watch.

CAPCOM I think we'll go along with that from here
on.

SC That was some party last night, Gordy.
Man that was a humdinger.

CAPCOM Must have been.

END OF TAPE

CAPCOM 17, Houston, over.

SC Go ahead please.

CAPCOM Okay, we're starting out late, as you know, but there's nothing ahead that we can see that's time critical so you might try to hurry a little but don't - don't go to any great lengths to try to catch up with the Flight Plan we can slip the LM telemetry activation without any problems, over.

SC Okay, we got you. Our biggest problem this morning is keeping Ron from going back to sleep.

CAPCOM Naturally.

SC By the way, my sleep recorder (garble).
Pretty good sleep (garble).

SC And if you believe that you're really - -

END OF TAPE

SC Okay, Houston, 17. I don't know if you're ready for this or not, but we have a few reports for you.

CAPCOM We're ready, go ahead, Jack.

SC Okay, on your CDR PRD 17028, claims 7-1/2 hours of good sleep. He had a Seconal before going to bed, and since the last reporting, he's had 4 containers of water.

CAPCOM Roger.

SC Okay, with respect to food, let's see, we gave you an intermediate report yesterday. Do you want that repeated?

CAPCOM Negative.

SC Well, I'm not sure I can differentiate what I said yesterday so I'd just better give it all to you. This is yesterday's complete report.

CAPCOM Okay.

SC CDR was scrambled eggs, 3 bacon squares, peaches, pineapple-grapefruit drink, peanut butter, jelly, bread, chocolate bars, orange drink, apricot, that's dried apricot, 1 frankfurter, a third of a fruitcake, half a beef steak, butterscotch pudding, orange drink and tea.

CAPCOM Okay, we got that.

SC Let me know if I'm too fast for you.

CAPCOM No, we've got it all on tape. Go ahead.

SC Okay, with respect to food yesterday - LMP, scrambled eggs, 4 bacon squares, large pineapple drink, cocoa, potato soup, 2 peanut butter, 2 jelly, 2 bread, cherry bar, orange-grapefruit drink, beef steak, orange drink and tea.

CAPCOM Okay.

SC Okay, and the PRD is -

CAPCOM Jack, we're just about to switch antennas now, why don't you wait till we get through before continuing.

SC Roger.

CAPCOM Okay, Jack. I think we're back with you again.

SC Okay, got you. LMP PRD 24064, 7-1/2 hours very good sleep, 1 hour intermittent, had a seconal, I took 2 aspirins yesterday, and since the last reporting, I've had 4 containers of water.

CAPCOM Roger.

SC Okay, CMP, the man of the hour, one might say. Scrambled eggs, bacon squares, peaches, 7 toast bread, orange juice, cocoa, peanut butter, jelly, bread, cherry bar, citrus beverage, fruitcake, butterscotch pudding, orange drink, turkey and gravy, 2 frankfurters and tea. You might say he was a little logy. Okay, CMP PRD 15027, 7 and let's - make that 8 hours of very good sleep, he claims he didn't get to sleep for awhile. Seconal and he's had 5 containers of water since the last reporting.

CAPCOM Okay.

END OF TAPE

CAPCOM Jack, in future reports, if it's any easier we can go to negative reporting. If you're fairly close to the menus, just tell us the differences, whatever is easiest for you is fine with us.

SC Okay. Well, now that we're eating well, that may be the best way to do it.

CAPCOM Okay. I have your consumables status, if everybody that's interested is listening.

SC Go ahead, Gordon.

CAPCOM Okay. Your RCS is running right along at 1.3 percent above the flight plan line. On your cryos the O2 tanks 2 and 3 are right on the line. Tank 1 is still as before about 4 percent below the line, but looking real good. On hydrogen, you're a little above on 1 tank, on tank 2; a little bit below on tank 3, but the average is right with the flight plan lines. So consumables look good. Over.

SC Okay. That's good to hear.

SC And, I see that old SPS oxidizer pressure has dropped some more. I guess the helium is working it's way in there, or out of there.

CAPCOM Okay. That's the way it looks to us.

CAPCOM One final thing. Management has informed me that since you've been so late getting to work this morning, we are going to have to dock you all at a day's annual leave.

SC All of us! I can understand, I can understand that for the Commander, since he's always the Commander (garble), but I do not understand why the LMP loses an hour.

SC Hello Houston, this is America.

CAPCOM Hello Geno, good morning.

AMERICA Hello Gordo. Request is that I handle the disciplinary problems up here, how's that?

CAPCOM Okay.

CAPCOM Geno, we have FAO work on a good time on the flight plan later here to work in a Captain's mast.

SC Okay, (chuckle) that'll be great.

SC Hey, Gordy, for the record; I swallowed three of those gas pills yesterday.

CAPCOM Okay.

PAO This is Apollo Control at 58 hours 11 minutes ground elapsed time into the Mission of Apollo 17. The crew at this time having a belated breakfast, having overslept about an hour, despite many attempts to raise them by playing the Kansas fight-song and the crew alarm being sent up on the up-link, which causes a warbling sound in the headsets. However, apparently, Ron Evans, who was on watch was unable to hear, since likely the earplug had fallen out of his ear while stirring

APOLLO 17 MISSION COMMENTARY 12/9/72 CST 09:33 GET 58:00 MC-240/2

around in his sleep. Some amount of levity there is - it was suggested that their pay be docked or they should be charged with one hour of annual leave at any rate. The spacecraft is presently 58 073, it's just now changed, 58 067 nautical miles out from the Moon approaching an ever increasing velocity as they draw near the moon now 3284 feet per second. The Earth's continuing to get farther away behind them 173 821 nautical miles. At 58:13 and standing by, this is Apollo Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/9/72 09:47 CST 58:14 GET MC-241/1

SC Houston, 17.
SC Houston, 17.
CAPCOM Okay, Ron, we see the 93's and you're clear
to torque them.
SC Okay, we'll torque them at 1920. And, Houston,
I've started the dumping.
CAPCOM Got ya.
SC And, Houston, we're going to dump A on the
water dump waste, good enough?
CAPCOM Okay.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/9/72 09:56 CST 58:23 GET MC-242/1

SC Houston, we're starting a 02 purge.

CAPCOM Okay, Jack.

SC Hey, Gordo, we'll get early clean up in the flight plan including eating up to 59 hours where we start checking the Delta P and pressurizing the CSM for LM entry.

CAPCOM Okay, we see you doing all that now and we're just checking things out as you call them - sounds good.

SC Okay, and then when we clean all that up regards to what the time will be we'll pick up the 59 hour mark then.

CAPCOM Okay.

SC Okay, waste water dump is terminated.

CAPCOM Roger.

END OF TAPE

SC Fuel cell purge complete.

CAPCOM Roger on the fuel cell purge.

SC Hello Houston, 17.

CAPCOM Go ahead.

SC Roger, while we're getting organized to eat a little bit here, I'll give you your morning weather report, if you want it.

CAPCOM Okay, go ahead.

SC Okay, Gordy, that little stormy - fairly big storm that was off the coast of north west Africa yesterday has moved inland and presumably is giving those people up there some weather, might even be getting some snow up in the Atlas Mountains. It's still fairly well organized and inland a few hundred miles or - the edge of it inland a few hundred miles. The people at the Cape of Good Hope ought to be seeing some clouds - forerunners of a large circulation system that's south - southwest of them. That although large it seems to have most of it's heavy clouds to the southeast of the center and they may not get any major weather out of this one. But, they'll probably have cloudiness for a few days. The storm that was over Buenos Aires yesterday is fairly moved out to sea and is now west - or east southeast of that area. Otherwise the - except for those 3 storm areas the south Atlantic looks relatively calm. The zero phase point is now off the east coast of South America and it looks fairly dull and grey and I suspect no extensive chopiness in that area.

CAPCOM Jack, take a breather there we got antenna break coming.

CAPCOM Okay Jack, we're back with you and listening.

SC Okay, Gordy, I can't see you right now, I think that was about the extent of it. We'll get some food and while I'm eating I'll look at it and see if there are any more details.

CAPCOM Okay.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/9/72 CST 10:18 GET 58:45 MC-244/1

PAO This is Apollo Control. As Lunar Module Pilot Jack Schmitt began describing the global weather systems, as he saw them, from almost 180 000 miles out from Earth, the weather service meteorologist here in the Control Center, Allen (Sandy) Sanderson brought in some TIROS weather maps and laid out on the spacecraft communicators console, so that CAPCOM could follow what Schmitt was describing. The crew still having breakfast at this time. CAPCOM is going to describe the tracking after the mid-course 2 yesterday. Spacecraft now 56 962 miles from the Moon, approaching at a velocity of 3284 feet per second.

CAPCOM 17, Houston. I have the morning news here, whenever you'd like to hear it, if you would.

SC Go ahead, Gordo. We'd like to hear it now.

CAPCOM Okay. First a look at the weather in the local area. It's going to be mostly cloudy through Sunday, with a chance of showers here today, but much warmer. I'll have to wait until we get through the OMNI switch here and then I'll be back with you.

END OF TAPE

CAPCOM Okay, 17. Continuing on with the weather, it should get up to the upper 60's here in Houston today. It was foggy when I came to work, but understand the sun is out now and the fog is 'burned off. On the International-National scene, there's another reported snag in negotiations between Dr. Henry Kissinger and North Vietnams Le Duc Tho. The two have discussed the peace terms since Monday, but so far little news concerning the talks has been released by either side. They meet again today. A judge in the Pentagon Papers trial on Daniel Ellsberg has declared a mistrial. Judge Matt Burn has asked that a new jury be selected. Both sides in the cases must now go back to the beginning and prepare their arguments again. Former President Harry Truman is still hospitalized with a serious heart condition. Although listed in critical condition, the 88 year old former Chief Executive has shown some improvement, according to his daughter, Margaret Truman Daniel. President Nixon has completed selection of his new cabinet by announcing that he will keep Richard Kleindienst as Attorney General. There will be a number of major changes, though, in upper levels of the Justice and Interior Departments. Life Magazine will be no more as of the end of December. The pictorial magazine lost over 30 million dollars during the past four years. No doubt some of the final pictures to appear in the famous 36 year old publication will be those of the Apollo 17 mission. An airliner crashed at Midway Airport in Chicago, Friday. Of the 61 persons aboard, only 18 survived the crash. In other national and international highlights, unemployment figures show a drop to the lowest level in two years. 5.6 billion dollars has been released by the federal government in the first revenue sharing payment to the state and local governments, and the NATO Foreign Ministers have urged the Soviet Union to cut down troop strength and allow freer movement of people over the east-west borders. In local and regional news, new hijack control devices have been installed at Houston Intercontinental Airport. The new metal detectors are being installed in many airports around the United States. New inspection procedures will also begin in January of all hand luggage carried aboard airliners. And on the sport page, Al Conover is not going to return to Wake Forest as rumored. The Rice coach has met with University President Dr. Norman Hackerman to discuss a firm five year contract agreement. Professional football highlights today's sports, the "Over-The-Hill-Gang" from Washington with Billy Kilmer and Larry Brown will take on the Dallas Cowboys at Texas Stadium in Irving. The Cowboys will no doubt go with Craig Morton at quarterback. Dallas can insure itself of a "Wild Card" slot in the playoffs with the Redskins, if they win. For Dallas it's a revenge game. The Skins have won nine straight.

CAPCOM Johny Bench, the Cincinnati Reds all-
everything catcher, has been hospitalized for tests. X-ray
showed a spot on a lung. Doctors feel sure the lesion is
benign, though. The University of Houston basketball team
takes on Xavier tonight. The Cougars, with four wins and
one loss, will face a Xavier team that likes to play slow-
down basketball. The Houston Rockets beat the Portland,
Oregon Trailblazers last night in Hofheinz, 114 to 108. The
Big Eight Athletic Conference has joined the Big Ten and the
Ohio Athletic Conference in breaking relations with the U.S.
Olympic Committee. Back in Houston again, Bill Peterson,
the Oiler Coach, says he's not planning on new Assistant
Coaches. He says the Oilers need more togetherness with
their coaches, not new ones. And a final item, the Des Moines,
Iowa Post Office was emptying a mail pouch. One package
fell on the floor, broke open, and spilled all over the place.
The contents were Postal Service instructions on how to wrap
and mail packages to insure safe transit and delivery.

SC Very good news report, Gordo -

SC Yes, that crash in Chicago, can you tell
me a little bit more about it?

CAPCOM I read real briefly in the paper, just
before I came in that it did crash in a populated area, so
it's a very brief report. I don't think the final details
have been published yet. I'll check to see if we've got
anymore in.

SC Okay, and I guess you know where - at
least my wishes go for that Cowboy game, don't you?

CAPCOM I'm not sure that I do.

SC I'll just let you make an assumption.

CAPCOM Okay, we've got an antenna switch coming
here.

END OF TAPE

CAPCOM 17, Houston. I have a little more on the plane crash, if you'd like to hear it.

SC Yes sir, Gordy. Go ahead.

CAPCOM Okay. It was a United Airlines jet, 61 people aboard, and it crashed into a south-side Chicago neighborhood while trying to land at Midway. Most of the 55 passengers - they were - I'm not sure I'm getting all the numbers right here but it said here that most of the 55 passengers were found dead in the debris and it was a Boeing 737 about a half a mile away from the airport. One of the victims was representative George Collins, a Democrat from Illinois, who was returning from Washington to organize a children's Christmas party. The weather, at the time, was 500 foot ceiling and one mile visibility and sleet and snow were falling at the time. There were no reports that any occupants of the houses were injured or killed. I turn back to the back of the paper, here. A United spokesman said one of the six crew members, a stewardess, was among 16 persons admitted to Holy Cross Hospital. She said there were 2 infants among the passengers. Jet apparently missed runway 13 at Midway on - that cruised over the neighborhood of bungalow homes at heights of 500 to 1000 feet and then with his nose up and tail down tore into the dwellings. Witnesses said the plane scraped the roofs of 2 bungalows and sheared through 6 houses, setting them aflame. The fuselage of the airliner split but the nose remained intact. A tail section was sticking out of one house. The following airliner sheared through utility lines and a 2 square mile area was blacked out. Telephone service was knocked out. A power company spokesman said 5000 homes were affected.

SC Okee-doke.

CAPCOM And a little news about your trajectory. Since the midcourse 2 you've been looking real good. You've - you're homing in on 53 1/2 mile parallel. We're discussing midcourse 4, which if we do it at all, is going to be very small. Its looking like about a foot and a half per second right now. And I guess if we do it, it will only be because it will save us Delta V at LOI. Over.

SC Okay, I was just looking. Those dumps really knocked us for a loop, didn't they?

CAPCOM Yes, it - it's driving your PTC out.

SC Yes, we're at almost 40 degrees, now.

SC Gordy, has the temperature been pretty cold down there?

CAPCOM Here in Houston it warmed up considerably last night - yesterday afternoon and last night and this morning it's probably in the 60's somewhere.

SC Garble.

END OF TAPE

PAO This is Apollo Control, 59 hours 11 minutes ground elapsed time. Apollo 17 currently is 56 148 nautical miles out from the Moon closing on the Moon at 3284 feet per second. Distance from Earth is now 175 441 nautical miles. We'll continue to leave the line up as we proceed into today's activities which includes another activation and check out of the lunar module and hopefully today the communications noise will be somewhat less than it was yesterday. At 59:13 standing by, this is Apollo Control.

CAPCOM 17, Houston, I have some words about the troubles we had during the LM comm checks yesterday, if you have a free moment to listen.

SC Go ahead, Gordy, we're listening.

CAPCOM Okay, we think we've got a pretty good handle on what the problem was and that was that the - the LM communications gear, we think was jumping on the voice sub carrier rather than the main carrier and the symptoms that we had point to that. What would happen is when I would try to transmit that it would lose lock soon as I put modulation on the voice sub carrier. During the checks today, we're gonna try to verify that the system is indeed working okay and we can do it without any changes in the onboard procedures by - purely by procedures that will be handled at the ground site and here at Mission Control and so that's what we're planning to do. We really don't - the problem that happened has been seen before evidently and it's not that unusual. We really don't think there's anything wrong with the onboard equipment. Over.

SC Sounds good, Gordy. We'll just take her slow and easy when I get over there today and make sure we understand it.

CAPCOM Okay, Jack, and there's real no voice check scheduled and we don't think any are required. We can tell what we need to without any voice checks again.

SC Gordy, you're breaking up, talk to you as soon as we get another omni.

CAPCOM Okay.

SC While I got, I took 3 pictures of the Earth. Thought I might have moved one of them and we're on frame 145.

SC Did you copy, Gordy?

CAPCOM That's affirmative, Jack, I copy, you may not be reading me through the omni switcher.

SC Okay, that was mag November, November.

CAPCOM Roger.

END OF TAPE

SC Houston, 17. Do you want us to go into a battery B charge?
CAPCOM Let me check, Jack. That's affirmative, go ahead.
SC Okay.
SC Battery B is being charged. And Gordy, different than the life - last time the charger amps is moving up very slowly started out at about 2 tenths and now it's one amp, little more, it's still going up. Before it jumped right up to about 2 amps. Is that expected?
CAPCOM Oh - we'll check on that. Stand by.
SC Gordy the LM/CM Delta P is .6, you still want to take the command module up?
CAPCOM Geno, that'll be fine, you will not have to jack up the command module pressure.
SC Okay, I think I'll maneuver it attitude then.
CAPCOM Okay, sounds good.
CAPCOM Jack, the way the amps are going to look when you put the charger on is the function of the state of the charge of the battery and what you describe is about what we'd expect considering where the battery should be.
SC Okay, that's what I figured. It's up about 1 and 3/4 amps now.
CAPCOM Roger.
SC And it appears to be stable.
CAPCOM Okay.
SC Gordy, I'm in the process of - I'm in the process of putting biomed sensors on.
CAPCOM Roger.
SC Hey, Houston, 17. Thanks to a little South Carolina boy we had up here last time, we've got some grits up here, and they're really not too bad. A little butter on them and a little bit dry - of course, you could add a little more water to it then they'd be a little better, but not bad at all.
CAPCOM I can't believe I'm hearing that from a real Yankee.
SC Of course, Kansas is not exactly Yankee.
SC Let me tell you that does not apply to the little old farm boy from Chicago.
CAPCOM Rog.
SC As you students of American History may recall, Kansas caused a lot of the problem we had with those 2 people.
CAPCOM Roger.
SC And grits is causing the rest of it.
CAPCOM 17, Houston. We see that you're making a maneuver uncoupled in pitch and we'd rather you make it coupled to keep FIDO happy, over.
SC Okay.
SC Yeah that was my fault, Gordo, I screwed up here.

END OF TAPE

SC Houston, emergency cab repress is off.
CAPCOM Roger.
SC Okay, repress vacuum valves off.
CAPCOM (Garble).
SC Hello, Gordy. You with us?
CAPCOM Yes. How do you read?
SC We're reading you loud and clear. The
emergency cabin pressure select is off, and we're about ready to
open the equalization valve.
CAPCOM Okay. And we're ready for the high-gain.
SC Okay.
PAO This is Apollo Control 59 hours 44 minutes
Ground Elapsed Time into the mission of Apollo 17. The crew,
at this time, making preparations for entry into the lunar
module.
SC Gordy, that's the high-gain. How do you
like it?
CAPCOM Looking good.
SC Okay, Gordy. I was reading .2 on the
Delta P and the hatch is cracked.
CAPCOM Roger, Gene.
SC Hey, Houston, 17. How do you read the
LMP's biomed?
CAPCOM Let me check.
CAPCOM Jack, the EKG looks great. Your ZPN
looks like a sensor might be loose. And we'll be handing
over here in about 30 seconds.
SC (Garble)
SC Okay, we're in the process of getting
the probe and drogue out. I've pushed on the sensors real
hard again and see if that helps it.
CAPCOM Okay, we'll take a look.
SC That helped it. Don't worry about it
until we call you again.
SC Descend to that one, Gordy.
CAPCOM You've always been one of those smooth
talkers.
SC They're down there somewhere.
SC Okay, the probe is out. And we'll try
the drogue now.
CAPCOM Okay, Ron.

END OF TAPE

SC Okay the drogue is out and we're going up
to take another look at Challenger.

CAPCOM Okay, Gene.

SC Somebody left their lights on in here.

CAPCOM Rog.

SC It's just like a refrigerator.

CAPCOM Rog.

SC Docking index is unchanged.

CAPCOM Okay, it's a plus 1.2. Right?

SC That's affirm.

CAPCOM Ron, Houston. Over.

SC Go ahead.

CAPCOM Okay, Ron. When you get a moment, when it's
convenient, we'd like you to go up to the latch #4 there, the one
that's been giving us trouble and we'd like you - - Well, we think
it's just half cocked and we'd like you to stroke it. We think
it will probably cock on one - with one stroke. We'd like you to
stroke it at least twice more to verify that it is really cocked.
And as you do stroke the handle, we'd like you to notice approxi-
mately what point in the throw that the resistance increases.
We can summarize what we want you to do if you keep us advised as
you go along.

SC Okay.

CAPCOM We - We're going to leave it cocked then from
here on until redocking after rendezvous, well, - we don't want to -
we don't want you to fire it.

SC Sure. Understand.

SC Houston. We're transferring to LM power.

CAPCOM Roger.

SC Okay, Houston. I'm going to give them LM
power for the GO.

SC Reset and OFF. And we have LM power.

CAPCOM Roger.

END OF TAPE

SC Gordo, this is Geno.
CAPCOM Go ahead, Gene.
SC Okay. While my compatriots are carrying out their respective tasks, I'm going to go off the air for a few short minutes. And, I'll give you a call when I get back.
CAPCOM Okay.
SC And, I'm in step three, Gordy on 2-2.
CAPCOM Roger.
SC Okay, Houston. America here. I'm on my docking latch #4 now.
CAPCOM Okay, Ron.
SC Okay, the handle itself is free swinging up to a point about 1 inch beyond the back side of the j-hook.
CAPCOM Roger.
SC And, I'll go ahead and try to cock it now.
SC Gordy, ED Batts are 37.2 and 37.2 and the Buss voltages are 26.2 and I'll bring you on the high taps.
CAPCOM Okay, Jack. Sounds good.
SC And Houston. As we all suspected it has one cock on it, or it had one cock. Now it's fully cocked. And the handle itself is free-swinging. The plunger has depressed, ohh, almost 3 quarters of an inch from the top. And it is no longer parallel with the surface.
CAPCOM Roger, Ron.
SC Okay. When you look back in the side of it there, that little j-hook with the snowman in it, the snowman's head points - as you look directly at the side of it it points - the snowman's head is at 8:00 and the connecting link from the one that connects - the one that goes into the plunger to - to the little fat J-bar there, is parallel with that slot, so that the point of the J sticks out.
SC So it is indeed fully cocked.
CAPCOM Okay, Ron. Sounds good and that's where we'd like to leave it.
SC Okay. Will do.
SC Okay. Step 5, 2-3.
CAPCOM Roger.
SC Okay, Houston. Step 5 complete. Glycol pressure is 21, it's down down about PSI from yesterday.
CAPCOM Okay, Jack. Copy.
SC And, Houston, is magazine II a good one to use for a - some opportunity interior photos?
CAPCOM Let me check, Ron.
CAPCOM That's affirm, II sounds good.
SC Hope so. Looks like that's the only one I have.
CAPCOM Do you, - Do you recall when you did the Heat-Flow on HH, have you used all of HH up on that experiment?

APOLLO 17 MISSION COMMENTARY 12/9/72 CST 11:35 GET 60:05 MC-251/2

CAPCOM Don't get it out to look for, just wondered if you remembered.

SC That's for. No it ran out. It didn't - I got the complete cool-down part of the ex - of the experiment on HH and then switched to high. I got about 2 minutes of high before the film ran out again. Had a high power on the - on the - -

CAPCOM Okay, Ron. Thank you.

SC After the main part of the experiment was complete.

CAPCOM Roger.

CAPCOM Jack, we're copying LM data now.

SC Okay, Gordy. Beautiful. I was just going to say step six is complete.

SC Houston, 17.

CAPCOM Go ahead.

SC Roger. I just was thinking while I was waiting here the cleanliness of these two spacecraft is certainly a tribute to the - all the people at Grumman and Downey and at the Cape, who worked so hard to put them that way.

CAPCOM Okay. We'll make sure they hear about it.

END OF TAPE

CAPCOM Challenger, Houston. We're - we've looked at the LM data and it looks perfect, no problems at all. What we're doing right now, though, is the checkout on the carrier and subcarrier lockups on the LM comm. So far, we've had no trouble with it, but we haven't quite completed routinely what we wanted to try. Over.

CHALLENGER Okay, I understand Gordie. No hurry here.

CAPCOM Okay, Jack. We've completed our investigation of our COMM, there. It all looked good. You can put a sign on page 2-4.

CHALLENGER Roger.

CHALLENGER Say, Gordie, I see I neglected to pull the bal load circuit breaker when I went to - after going to high taps. You want me to go back and show you that again?

CAPCOM Stand by.

CHALLENGER That's the bal load breaker on 16, so the busses were tied together.

CAPCOM Roger, understand.

CAPCOM Jack, there's no need to go back. Just keep on going.

CHALLENGER Okay, sorry about that.

CAPCOM No problem.

CAPCOM America, Houston. We're all ready for the E-mod dump, if it's convenient to you.

AMERICA Houston, this is America, I guess that's for me isn't it?

CAPCOM That's right, for Captain America.

AMERICA Okay, we'll get her here.

AMERICA Okay, Verb 74 ENTER.

CAPCOM Okay, we're getting it.

AMERICA Okay.

AMERICA And Houston, we have 50 percent remaining on magazine India India.

CAPCOM Roger.

AMERICA (garble)

CAPCOM Okay.

CAPCOM Okay, America, we've got the dump.

AMERICA Okay, I understand, you have the dump.

PAO This is Apollo Control at 60 hours

35 minutes ground elapsed time. LM checkout apparently going along quite well at this time. The bulky docking latch has been recocked and will be left in that position until re-docking after lunar orbit insertion after the landing. Apollo 17 is now 53 438 nautical miles out from the moon. Velocity now 3286 feet per second. Meanwhile, back at Earth, the spacecraft is now 177 980 nautical miles from the Earth. At 60:36 standing by, this is Apollo Control.

END OF TAPE

APOLLO 17 MISSION CONTROL 12/9/72 12:10 CST 60:37 GET MC253/1

CHALLENGER Hello Gordo, this is Gene-o. I'm back on the line.

CAPCOM Okay, welcome back.

CHALLENGER Yes, I was just testing out the survival techniques in space.

CAPCOM Roger.

CAPCOM Did you survive?

CHALLENGER Well, so far and we've got the LM back on CSM power.

CAPCOM Okay.

CHALLENGER Gordo, it's called education of necessity.

CAPCOM Roger.

CHALLENGER Okay, I guess the LM looked pretty good to you, huh?

CAPCOM Yes sir. It looked perfect and we also went through the little communications main-carrier sub-carrier lock-up check and the COMM system worked perfectly, so there's no problem at all to report.

CHALLENGER Okay, fine. We'll start in with Jack donning and the PGA and then I'll follow.

CAPCOM Okay.

CHALLENGER Gordy, How did that ZPN turn out?

CAPCOM Let me get another check here.

CAPCOM Okay, Jack, it looks fairly good right now. Don't bother changing anything.

CHALLENGER Well I'm just going to be in a position to work on it in a little while and if the occasion arises, I could.

CAPCOM Okay, we'll keep that in mind, although, it looks reasonable at the moment. It has shown some - at sometimes it's gone from edge to edge on their scale but it has come back in right now. I'll find out later if we want to do anything.

CHALLENGER Okay, the electrolite pads maybe still expanding a little bit so I'm going off the air briefly to start getting into the suits and I'll talk to you in a little while.

CAPCOM Okay.

SC Hello Gordo.

CAPCOM Hello.

CHALLENGER Okay, we're up to Frame count 151 on magazine November November they have been pictures of the - primarily of the CSM out the LM windows by the CMP.

CAPCOM Okay.

CHALLENGER He's been up there fooling around for a while. We may have to check it out and see what he did.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/9/72 CST 12:28 GET 60:55 MC-254/1

CAPCOM America, Houston.
SC Go ahead, Gordo.
CAPCOM All that dropout there was because Ascension had a problem. We're now over on Madrid and you're sounding good.
SC Okay.
SC Okay, Gordo. Jack is in his suit, unzipped at this time. I'm going off the air and Ron will come on, and keep you informed as to how we're going.
CAPCOM Okay. Fine.
SC Houston. How do you read the LMP?
CAPCOM Loud and clear, Jack.
SC Okay. I'm in my suit presently unzipped. Didn't seem to be any problem at all.
CAPCOM Okay.
SC And, Gordy, I think I found the problem with the Biomed sensors. When I come out of the suit I can fix it. I put a little of that bacterial cream on the sensor places last night as a preventive mechanism and I think it's just a little greasy to hold the sensor.
CAPCOM Okay.
SC Okay. Gene's got his suit on and he's going to cross into the LM now.
CAPCOM Roger, Ron.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/9/72 CST 12:42 GET 61:09 255/1

AMERICA Okay, this is CMP, I'll go off the line here for a little bit till I can get my suit on again.

CAPCOM Okay, Ron.

AMERICA And Jack's still on the line up there in the LM though.

CAPCOM Okay.

CHALLENGER Okay, Houston. We're both zipped now and it went quite easily.

CAPCOM Okay, Jack. Sounds super.

PAO This is Apollo Control at 61 21 ground elapsed time. Position and velocity on the spacecraft now 51 982 nautical miles from the moon, velocity 3288 feet per second, distance from earth 179 437 nautical miles. Crew completing their checkout of the lunar module, getting partially suited in their pressure garment assemblies or space suits, if you will, for the installation of the probe and drogue, and closeout of the tunnel into the lunar module. At 61:22 up and live on the air-ground circuit, this is Apollo Control.

AMERICA This is CMP. I finally got my suit on now.

CAPCOM Go ahead. America, Houston. Did you call?

AMERICA I just said, the CMP. Got my suit on now, and I had a little trouble with the donning liners getting stuck in the zipper, but I figured out how to get them out of the way now.

CAPCOM Okay.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/9/72 CST 13:08 GET 61:36 MC-256/1

SC Okay, Houston. Gene has his suit pretty well off now.

CAPCOM Okay, Ron.

CAPCOM We reviewed the data on the R-mod. Everything looks normal. One thing, right here is, - no big thing, but you might zero NOUN 26. It's still loaded, left over from the EMP used in the P23 yesterday.

SC Okay. Thank you much.

SC Gordy, this is the LMP, how do you read?

CAPCOM Loud and clear, Jack.

SC Say. When I was switching batteries I noticed switching from low to high-taps that there were some reverse current indications. Sure that's nothing to be concerned about, you probably expected those. Right.

CAPCOM That's affirmative, Jack. That's normal.

SC Right.

PAO This is Apollo Control. From all indications on telemetry here in Mission Control, the crew at this time has closed the Lunar Module hatch and it should be reinstalling the probe and drogue assemblies. And finally the Command Module hatch, thereby closing out the tunnel. Apollo 17 now 177, whoops would you believe our space digital have gone back to Earth reference momentarily. At any rate the spacecraft is 177 966 nautical miles from Earth, traveling at a velocity of 2652 feet per second in - with reference to the Earth. And as soon as the space digital display goes back to the Moon reference, we'll read those numbers off. We're waiting for the call from the call crew that they have completed stowing or installing the probe and drogue assembly in closing out the tunnel. At 61:51 standing by this is Apollo Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/9/72 CST 13:24 GET 61:51 257/1

CAPCOM America, Houston. We'd like to terminate the charge on battery B.

AMERICA Okay, stand by 1. Okay, we'll get that in a minute, Gordon.

CAPCOM Okay.

AMERICA Okay, Gordo, the charge should be terminated on bat B.

CAPCOM Okay.

AMERICA And 7 alpha is still .6.

CAPCOM Roger.

AMERICA Okay, Gordie, I'm looking around, but I can't figure out what that master alarm is? I didn't see any O2 high flow and I didn't see any lights and we did get it down in the LEB.

CAPCOM Okay, Gene.

AMERICA And there it is again.

CAPCOM Roger.

AMERICA And again.

CAPCOM Roger.

AMERICA Okay, I saw SPS pressure blink on that one.

CAPCOM Roger.

AMERICA Yes, Gordie, keeps triggering continually on SPS pressure.

AMERICA Yes, I can reset it and a minute later she's coming up with a blink on SPS pressure.

CAPCOM Okay, Gene. We think it's the, well, we're sure that it's the oxidizer pressure, it's right on the trip limit, we're almost certain it's due to helium absorption.

AMERICA Yes, we're reading 155 right now.

CAPCOM Roger.

AMERICA Okay, Gordie. We got the SPS pressure light on steady now.

CAPCOM Roger.

CAPCOM America, Houston. If you give us ACCEPT, we'll give you a new state vector. There's not much wrong with the one you've got but we're just going to teek it up.

AMERICA Okay, Gordie, you've got it.

CAPCOM One other question, do you have the LM closed up, now. We're seeing some heater currents that are a little higher, indicating maybe the lights still on, we're just trying to understand where the LM is at the present time.

AMERICA Okay, I just closed the hatch, just about the time you started talking there.

CAPCOM Okay, we'll take a look at the temps now.

END OF TAPE

CAPCOM America, it's your computer and we did the VERB 66.

AMERICA Okay.

AMERICA Hey, Gordo, what's the trend in thinking on that SPS light, to leave it lit or to bump the pressure up?

CAPCOM Ed Mitchell must be at work. Because we were just talking about that subject. I'll call you when - with a final decision.

CHALLENGER Okay. And Ron has put - has closed LM hatch, put the drogue in and he put the probe in and he's putting the CSM hatch in as a one-man exercise suited. So, he's doing the whole thing and he's still in his suit. Our suits are stowed.

CAPCOM Okay, Gene, we got one question here, that - just waiting for a convenient time to ask, and I was wondering is with reference to the wakeup problems we had this morning. If you clarify just exactly why Ron didn't hear our crew-alert master alarm, you know exactly why?

AMERICA Well, it's not the Seconal. As much as I hate to admit it, the power audio tone was off (chuckle) in my headset.

CAPCOM Okay. We kind a suspected that - -

AMERICA So, - Okay, that lets you rest a little bit easier. And just to prevent something like that from happening again, or if it should happen again, what we'll do we'll hook up the tone-booster, which we didn't have hooked up last night.

CAPCOM Okay. And we concur positive.

AMERICA Yeah. I woke up and I saw that light there and I thought gee whiz, I just got it in time until I tried to push out that caution and warning master alarm. And worked the end of my finger.

CAPCOM (Laughter)

AMERICA I was also in a sleep restraint and upside down was a zipper in the back and I had a little problem in getting my hands up to start with also.

CAPCOM Rog.

AMERICA Hey Houston, cabin repress is back to both now. I mean emergency cabin repress.

CAPCOM Roger, Ron.

CHALLENGER Gordo, if you don't have any objections, we'd like to go ahead and secure the high-gain and go on a PTC while Ron's doffing his PGA.

CAPCOM Let me check and see if we have any.

CAPCOM Sounds good to us. Go ahead and - per flight plan and spin it up.

CHALLENGER Okay.

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CAPCOM (garble) I mean get ready to spin it up. We'll
give you the go to spin it up.

CHALLENGER Okay.

CHALLENGER Okay, Gordy. You want to leave the high-gain
until you call?

CAPCOM Stand by.

CAPCOM Okay. Jack this is a good attitude to go OMNI
BRAVO and you can go ahead and secure the high-gain.

SC Okay.

END OF TAPE

CAPCOM America, Houston. The rates look good, you're GO for spin up.

AMERICA Okay, great Gordo, we're GO for spin up. We've got a show in here that very few men have ever seen, and that's the CMP trying to get out of his suit by himself.

CAPCOM Wish I was there to watch.

AMERICA It really is a story to behold. Needless to say, we're both very impressed.

CAPCOM I can tell.

CAPCOM America, Houston. Use BD ROLL for spin up.

AMERICA Okay.

AMERICA Okay, Houston. This is the LMP on bio-med. How do you read?

CAPCOM Okay, Jack. Let's take a spot check here.

CAPCOM America, D2 ROLL is not on, you need the delta roll checked.

AMERICA Yes, I'm still working on it, Gordo. I was just deciding whether it's minus or plus, but I guess we'd better stay minus as per flight plan.

CAPCOM Okay.

AMERICA We're on our way.

CAPCOM Okay.

CAPCOM Okay, the LMP DKG and ZPN look good, and on the SPS light, we recommend not doing anything with the system. We want you to go to acknowledge so the - to get the light out of your eyes, and then just fly there and acknowledge indication of warning.

AMERICA Okay, Gordie. We're in acknowledge, and I presume, probably after LOI, we'll be able to go back to normal, right?

CAPCOM That's affirmative.

AMERICA Is that an abnormal amount of helium injection or do you think that's about right?

CAPCOM It's absorption, and that's normal.

AMERICA Hello, Houston. You read?

CAPCOM Loud and clear.

AMERICA Okay, now that we got another look at you Gordie, it looks like Houston might be right on the fringe of either being clear or clear, the entire Gulf is pretty nice. Florida looks pretty clear and Mexico looks pretty clear. There's a big air mass of clouds that looks like it picks up somewhere around the coast at Houston and heads on up north and then covers most of the midwest and the east from about the middle of Mississippi, Alabama and Georgia on north. It's clear enough now to even see the coral reefs down off of Florida. And it looks like west Texas is probably also pretty clear, at least in a run from east to west. We

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AMERICA Can see Baja, and on up the coast of California up north.

CAPCOM Okay, sounds like the whole crew is turning into weathermen.

AMERICA It's one of the better views we've had of the states, I think, even though we're quite a ways out.

CAPCOM Roger. Looks like your sub spacecraft point is just about at Peru right now.

AMERICA Yes, it looks like we're looking straight down in the center of South America, pretty close to what you're saying. Gordie, you want to bring us up to date briefly on how you plan to handle this time update again?

CAPCOM Okay, I'll do that. But let me practice before I start here, just a minute.

AMERICA Okay, I'm primarily interested in those parts of the flight plan which we're going to eliminate.

CAPCOM Okay, just one second.

END OF TAPE

CAPCOM Geno, I'll read you the PAO release, they summed up pretty well, and I'll just use their words here. The time has been made up in two increments. The first one of 1 hour and 45 minutes in the flight plan. The crew activities were jumped ahead by 1 hour and they essentially began doing those things that were called for 1 hour later in the flight plan. They will again jump ahead 1 hour and 40 minutes and that will occur in 65 hours. By that time they will have completed all those activities required up thru 67 hours 40 minutes in the flight plan. Or in other words, they will have completed all the activities required to get them into Lunar Orbit 2 hours 40 minutes early and in order to make the clock then agree with where the crew will be in the flight plan we'll jump the clocks ahead 2 hours and 40 minutes. This clock update, which can be likened to going on day light savings time, only 2 hours and 40 minutes were in the change instead of one hour of change as we do on daylight savings time will occur at 65 hours when the crew will have completed all of those flight plan activities up thru 67 hours and 40 minutes. This simply involves setting our clock to 65 hours in the control center and aboard the spacecraft at 65 hours moving them ahead to 67 hours and 40 minutes. Then by any further changes in the mission timeline from that point on the elapsed time clock which are used as a cue to flight plan activities should agree with the flight plan in events that in the flight plan a call out for a certain time will have been at that time on the elapsed time clocks in mission control and aboard the spacecraft. This is a convenience factor.

SC You're lucky we're going to lose an OMNI.

CAPCOM Okay. I'll hold on there for the rest.

SC Gordy, never mind, I think I got the gest of it.

SC Did you give up Gordy?

CAPCOM Okay. What we're really going to do really is simple. At 65 hours we're going to do the update of 2 hours and 40 minutes. And the procedures are shown in the flight plan at 67:35. There just happens to be really no, no activities we have to reschedule in the intervening time. So, after the update is complete, we'll be right on the flight plan, both time-wise and activity-wise. Over.

SC Okay. We're looking at it.

SC And I have to squeeze my shave in somewhere else, I guess.

CAPCOM Hey, Gene, Houston.

SC Go ahead.

CAPCOM Hey, you got a break - cast the time vote which is the best description the water-bag or the cloth one.

SC Oh yeah, now I remember.

SC We got a little - give a little credit on this last one, I guess to Public Affairs. Because I don't think Gordo could have thought that one up all by himself.

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SC Very diplomatic.

SC Considering I was trying to do Charlie's technique step by step, I guess I got to give him little bit more credit from the gymnastic point of view.

SC That sounded like one of Gordy's aircraft schedules.

SC Amen.

PAO This is Apollo Control at 63 hours 9 minutes.

SC They were putting another Saturn V out on the pad.

CAPCOM Jack, we lost all of that due to the antenna switch, say it again.

CAPCOM Jack we missed your last transmission.

SC Gordy, you listening.- -

CAPCOM Due to the antenna switch.

SC You say you got it or you're getting it.

CAPCOM No we missed it.

SC Okay, I said you can look right down at the Cape area, that's the Cape that we know, in Florida and it's little disheartening because the last time I was up here looking back from this angle we were moving another Saturn V for another Moon trip out on the pad already. I guess they're working pretty feverishly out there on the - -

PAO This is Apollo Control at 63 hours 11 minutes ground elapsed time. Charlie Duke was on the spacecraft's communicators console for a while there, discussing the clock update description that had been read up earlier by Gordo Fullerton asking for a judgement on the part of the crew as to whether that description was better than - -

SC Jack, I think Gene was probably right. You got some, probably scattered cloud weather, but not very far away from you there's a pretty heavy mass of clouds. It may be the forerunner of that dry cold front you were talking about yesterday, which I can see stretching over into Synora, but where it hits the state side, you've got quite a mass of clouds associated with it and looks like they're moving in your direction.

CAPCOM Okay, Jack thanks for the warning.

SC Clear behind us in Arizona to Mexico and maybe Southern Colorado. It looks like there may be another front stretching, or maybe it hits Northern Arizona and Utah and up through Northern Colorado, and on in to Canada. Turning Northeast.

CAPCOM You're calling it right on Jack, I'm looking at the surface chart and that's about what we see.

END OF TAPE

CHALLENGER Looks like a low might be developing on that one - a wave up in Northern Colorado and - although the clouds are a little hard to read.

CAPCOM Roger.

PAO And that was lunar module pilot, Jack Schmitt.

CHALLENGER Up our zero page point, about 20 degrees west of Bolivia, are some - are zero - zero page point and it is quite a bit brighter than yesterday and looks as if and more general as if maybe the seas have picked up in that region a little bit.

CAPCOM Roger.

PAO Some more real-time weather reporting.

CHALLENGER Features is developed - as I see - developed in the South East Pacific just north of the Ross Sea and that is a very striking mushroom pattern on a very large scale. It has north-south cloud streaming streamers from the Ross Sea and when it gets up about the latitude of Tierra Del Fuego but quite a bit west of that land it branches out to the east and west in a large mushroom pattern. It looks like the top of that mushroom may be a curved cold front that's pushing it's way up into the southeast Pacific. It currently - the eastern edge of that front is probably 10 degrees longitude from Tierra Del Fuego and it looks like that land is in southern Chili and picking up high clouds, probably associated with that front's movement.

CAPCOM Roger.

CHALLENGER I'll get some shots of that next time around. That's a spectacular pattern. You almost get the feeling that the cold air mass moving out of Anartica streams for a while north-south and then it picks the cloud patterns change and it starts to migrate - the winds start to change from east to west. Maybe that's where it encounters the jet stream.

CAPCOM Rog.

PAO This is Apollo Control. Going through an antenna switch at the present time.

CAPCOM America, Houston, I have a couple of miscellaneous items here.

AMERICA Okay, go ahead.

CAPCOM Okay, we'd like you to disable B2 and D2 just for a drill.

SC Oh, thank you Gordo.

CAPCOM Also, the she tank looks exactly nominal as far as the rise rate goes to us.

SC Can't argue with that.

APOLLO 17 MISSION COMMENTARY 12/9/72 CST 14:46 GET 63:13 261/2

CAPCOM And to summarize your film by your situation have three magazines KK LL and MM budgeted for the scheduled photos such that they have only 5 19 and 1 respectively frames left over after you've done all the scheduled pictures. And november november we think has just has nine frames remaining now. The two nonscheduled magazines are OO and PP 160 frames each. Those are the ones provided for optional use. We have 44 additional frames scheduled out of November November scheduled during lunar orbit. There is only 9 left in it now so we'd like to save at least 60 frames out of either oscar oscar or pappa pappa the two optional magazines to cover the scheduled frames. Guess what we're saying is that there is no problem we've still got plenty of film, but you will have to use some of your optional mags for scheduled pictures 60 frames is what we want to save.

SC Okay, mighty fine Gordo plan on oscar oscar for that magazine.

CAPCOM Okay.

END OF TAPE

PAO This is Apollo Control at 63:23 GET.
The space digitals display here in the Control Center still showing Earth to Spacecraft distance and velocity. Distance 180 309 nautical miles, velocity relative to Earth 2593 feet per second. A few moments ago the lunar module pilot, Jack Schmitt, who is a professional geologist, put on his hat as an amateur meteorologist and described some of the global weather systems visible from their vantage point out beyond 180 000 miles from Earth. Still up live and standing by at 63:24 GET this is Apollo Control.

SC Gordy, this is Jack.

CAPCOM Go ahead, Jack.

SC I, Cal Tech will never forgive me, I'm little hesitant on my elementary optics, but I just put Ron's polarizing filter in front of the monocular looking at the Earth and rotate 90 degrees and from max to min in terms of brightness, there's a remarkable change. I suspect that means that the Earth is polarizing light enough to see it. The main thing that happens is that the oceans get considerably darker when I rotate the filter towards the dark position anyway. The continents don't seem to show any obvious change but the oceans and the geoface point darken, oh I would guess by a factor of 2 in brightness, maybe that an extreme, but I think it's that.

CAPCOM Ah, Jack, I was just trying to think of a reason, is it uniform change over all ocean areas or is it more of a change in some areas than others?

SC Well, I'd say that the sub-solar point shows the greatest change, but you can still - the geoface point shows the greatest change. But all the oceans get darker.

CAPCOM Very interesting. We are just about to switch OMNI.

END OF TAPE

SC Houston, 17.
CAPCOM Go ahead.
SC Gordie, I figure you're getting an optics briefing ready for me, right?
CAPCOM I haven't had anybody volunteer one. Strictly some laymen's theories going around, but nothing official.
SC Okay.
CAPCOM America, Houston. Just got started on the Cowboy-Redskin game, about 5 minutes into it. The Cowboys are ahead 7-0. They scored the first time they got the ball.
sc Gordie, you started talking before we had an OMNI. Try it again.
CAPCOM Okay. The Cowboy-Redskin game just got started. It's now 7-0, Cowboys. They scored the first time they got their hands on the ball.
SC Okay, I think we got most of that. It happened again, though. Did you say it was 7-0 Cowboys?
CAPCOM That's what I said. They scored the first time they got the ball. It's -- the game's just about 5 minutes old.
SC Outstanding. I thought this was Saturday. Isn't today Saturday?
CAPCOM It is, but college is all through, so the pros are playing on Saturday now.
SC Beautiful. Seven to nothing, huh? Go get 'em Cowboys.
SC But, he would say the same thing for Washington, I'm sure.
SC Nosiree. Go get 'em Cowboys.
SC Houston, 17.
CAPCOM Go ahead, Ron.
SC Okay, Gordo. My apologies on the CMD's in-suit drinking bag. There was, in fact, water in it. However, somehow, when we put the suit on the water bag had gotten turned sideways, I guess is the way they explain it. It got turned sideways such that the suction tube was crimped sideways. And, as a result, there is no way that you could get any water to go through the tube.
CAPCOM Okay. You're talking about the problem we had there just before launch, right?
SC That's affirmative -- prelaunch. Okay, and for your information, the PTC looks good it ought to, hold.
SC Okay. Mighty fine. I lost my scissors. If there is anything you can do to help me find them I'd appreciate it.
CAPCOM Okay.
SC Okay.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/9/72 GET 63:50 CST 15:23 MC264/1

CAPCOM Got a game plan update for you here. It's now 14-0 Dallas, still the first quarter.

SC God, you're sure a bearer of good news, Gordy. That's great.

SC Gordy I, this is Jack, I just tried the red filter on the front of the monocular, and about the only major thing I noticed was that the cloud patterns over the land masses seemed to be enhanced. The contrast between cloud and land, particularly green land, is enhanced. Otherwise, all it does is make the Earth look a little red.

CAPCOM Roger, Jack.

PAO This is Apollo Control at 63 hours 56 minutes Ground Elapsed Time. Space digital display still showing the Earth reference numbers 181 123 nautical miles out from Earth. Velocity 2573 feet per second relative to the Earth. There will be a change of shift press conference in the News center briefing room at approximately 4:15 with Flight Director Neil Hutchinson and at 63:56, standing by, this is Apollo Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/9/72 CST 15:34 GET 64:01 265/1

SC Hey, Gordo.
SC Hey, Houston this is 17.
CAPCOM Roger, Geno. I think we've got you now
go ahead.
CAPCOM Okay, Geno I think we got you now go
ahead.
SC Okay, I just happen to be throwing a
few switches and I see our helium tank temperature in quad A
is about 95 or so and the others are quite low is that be-
cause of our attitude there during the LM check out.
CAPCOM That's affirmative that's the reason.
SC Okay, I also see the tank that package
temperature is a little higher on that quad too. But, being
close to a hundred it seems a little unusual. Your happy, right?
CAPCOM That's affirm. No problem we've been
watching it. It seems to be coming down now.
SC Okay, fine thank you.
SC Houston, you want the H2 heaters to auto
and the pan 3 off now?
CAPCOM Stand by, Jack. That's affirmative, Jack,
go ahead.
SC Okay, that's done.
CAPCOM Now 21 to nothing Cowboys second quarter.
SC Super bowl here they come watch out now.
CAPCOM Should remind you that the commander in
chief is a Redskin fan.
SC I read about that. That's why the Cow-
boys need as much help as they can get.
SC Gordie, in the continuing saga of look-
ing at the Earth through rose colored glasses. I tried a
blue colored glass and it as you might expect, completely masks
out the continent. The land areas are just not visible
through the blue. Otherwise, the ocean and clouds - or the
constrasting ocean and clouds remains about the same.
CAPCOM Roger, Jack.
SC And Gordie, I tried putting all the
filters we had together to check the sun for sun spots but
just not quite enough line attenuation to do that.
CAPCOM Okay, for a while I thought you were a
human weather satellite. Now I think your a human earth
resources satellite.
SC Well, about all I can say is I'm a satel-
lite I guess.
SC Gordie, it looks as if the distribution
of water and ice in the right Ross Sea has changed in
the last day or two. I don't remember looking at it yester-
day specifically, but it seems to be different today than
it was the first day.
CAPCOM Roger.

END OF TAPE

SC Houston, 17.
CAPCOM Go ahead, Jack.
SC Yeah, about this ice pack in the Ross Sea the, as I remember a couple days ago, there were two clear areas, triangular in shape and quite elongate, that were projecting out into the sea from the intermost part of the bay or the, from the continent. Today those are not apparent or at least the first look I made. And it looks like there is an elongate more irregular clear area that is roughly parallel to the Antarctic coast line within the sea itself. We'll check that a little more closely and see if that's right.

CAPCOM Okay. Seems like kind of a quick change for something like ice. Doesn't it?

SC Yeah, and that's what bothers me. That's why I wonder if I'm not being fooled by cloud patterns or something.

CAPCOM I'm looking at a satellite picture here which I guess is around 12 hours old though, but over to the east of Australia, maybe about a continent width east of Australia there is really striking long frontal system, striking because it's so long and so straight, sort of west northwest extending west, northwest and east, southeast turning. Can you see that?

SC Gordo, are you there?

CAPCOM Yes, sir, right here.

SC Okay, now, Jack and I may be talking about two different frontal systems or patterns; but the one I think you might be referring to is the one I referred to yesterday as a ruffled parrot beak, actually two of them tied together one starting up probably southeast of Australia and then heading down with a long arcing frontal system to another clockwise rotational parrot's cone I should say, down around near the tip of South America between it and Antarctica. There is one strong tributary front heading up to the north northwest from the western side of this big arctic frontal mass. And I think that's probably what you're referring to, I'm not not sure, I can't quite see, Australia coming up over the horizon yet.

CAPCOM Okay. I, my picture cuts off right about oh, two-thirds of the way south in Australia, that latitude, so, most likely we're talking about the same thing; but I can't verify the southern part of it.

SC There is some tremendous - western side of that curve front, is a tremendous clockwise rotational air mass, it must cover hundreds of square miles. The one down near the continent of Antarctica, down there, near the tip of South America, seemed to be squashed slightly as if

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there is possibly some squashing or effect coming off the South Pole area near Antarctica. I think, if I turn around and look at it the way Jack was looking at it, it's a cap of a mushroom. Only instead of simply curving in underneath the cap it has clockwise rotations on both sides as it curves under.

CAPCOM

Roger.

END OF TAPE

PAO This is Apollo Control at 64:26 Ground Elapsed Time. The space digital's, meanwhile, has come back to Moon reference numbers. Our distance now from the Moon is 45 955 nautical miles. Velocity 3300 feet per second. And the Earth is 183 365 nautical miles behind Apollo 17. Shift change press conference at 4:15 with Flight Director Neil Hutchinson. Chuck Lewis taking over now, with his team of flight controllers at 64:27 and continuing to stay up live on the Air-to-Ground this Apollo Control.

SC Gordy, I just took 2 pictures of the Earth at the present time, and those are, right now the camera is on frame 153.

CAPCOM Okay, 153.

SC Gordy, where did you say your HES satellite picture left off to the west.

CAPCOM Okay, to the west it goes clear on over to Africa, but to the south it cuts off about 30 south, or not quite all of Australia.

SC Okay. Yes. That mushroom pattern we've been talking about, on either end, either end of the cap, the mushroom points north. Is a major cyclone circulation system. And also taking, moving, in one case or trending in one case to the northwest and the other to the northeast, there are linear cloud patterns. Gives it a very symmetrical and a striking appearance. I hope it shows on those pictures.

CAPCOM Okay, it doesn't show on the one I got. Maybe a later version will have that one. Because it's cut off on this one.

SC Hey, Gordo, this is Geno.

CAPCOM Go ahead.

SC To put this update in simple terms in 65, I guess, on our clocks, you'll update us to about 67:40, right?

CAPCOM That's affirmative.

SC Does that mean we have to eat 2 hours and 40 minutes earlier?

CAPCOM Oh, you got me there. I, you haven't been eating, you haven't eaten since breakfast. Is that right?

SC Oh, yes sir. We just finished. We'll take another go at it, but I feel I've spending my life here eating.

CAPCOM Yes. Well, we'll leave it up to you on this special case here.

SC Okay, I think we'll take a jab at supper here later in the day as per the flight plan.

CAPCOM Allright.

SC Gordy, the whole suiting operation, I was really very pleased with. Jack and I both got in our suits very easily, and one by one we went into the LM and that's where we zipped

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SC each other up and we really had little or no trouble. We took our time. We got all configured in terms of changing our pockets around and whatever else we need to do. And actually I think it's much easier to get suited than it is to get unsuited, personally.

CAPCOM Okay, sounds good.

SC Ron stayed suited and did the entire tunnel work. And then went, did it by himself and then totally doffed his suit and stowed it by himself also to sort of extend that little (garble) exercise.

CAPCOM Roger.

PAO This is Apollo Control at 64 hours 43 minutes. Change of shift News Conference is ready to begin in the News Center briefing room. We'll take this line down now and tape for the duration of the News Conference.

END OF TAPE

PAO This is Apollo Control at 67 hours 45 minutes. We have advanced the Ground Elapsed Time clock in the Control Center and on the Flight Plan are operating at the point indicated for that time. In the News Center, the monitors, the actual GET time will be shown on the Time Base 5 clock. The GET clock will now show the Flight Plan GET time. And in the Flight Plan, the Central Standard Times and GET times listed will now agree and be correct. We accumulated a few minutes of tape during the News Conference and we'll play that for you now.

CAPCOM Jack, Houston, halftime score is 28 to 3, Cowboys.

SC Keep talking, Gordo.

CAPCOM Okay, I'll keep talking. The, Ron, when you get to the ALFMED board out there, you'll see some tape around the emulsion field, so there three rectangular areas in front of your eyes and to either side that contain the photographic emulsion. This tape is around the edges of each of those three areas to help seal out light leaks. You haven't seen it before. Leave the tape on there. Don't pull it off. Over.

SC Okay.

SC Gordy, just took a series of pictures of the Earth with the 35 millimeter using the polarizing filter in the two positions. And the frame count is now 39. I took 6 pictures. And with the filter on the first of each pair, in the down position. The second's in the up position and I changed the F stop. The first set at F4, the second set at F2, and the third set at F8.

CAPCOM Okay, we got all that Jack.

SC And Gordy, you might ask one of the experts around there is the light meter in the 35 millimeter integrating over the interior spot or over the hairline spot, The larger one?

CAPCOM Okay, I'll ask.

SC It acts as if it's the interior one, but
(garble).

CAPCOM Okay.

CAPCOM Jack, answer to your question there, there's a center spot is weighted for 60 per cent of the reading and the rest of it for 40 per cent. Over.

SC Okay. That makes sense. That would explain why the needle moved as I moved it across the series of spots.

CAPCOM Roger.

SC Gordo, we're ready anytime you are for that update and after we get the TFM and everything squared away, we'll go into ALFMED.

CAPCOM Roger. Stand by on that, Geno, and we'll be with you in a minute.

SC Hello, Robert. How are you today?

CAPCOM Real fine, Gene. You're sounding great.

SC Doing great out here.

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CAPCOM Geno, we're ready for the clock update. We'd like POO and ACCEPT and we've got two loads to put in, so it will take a couple of minutes here.

SC Okay, you got it?

CAPCOM Thank you, Ron.

CAPCOM Update on your fly by maneuver pad due to this clock update. Would you like to copy it?

SC Stand by just one second.

SC Okay, Houston. Go ahead with the fly by pad.

CAPCOM Okay, stand by 1 on that. We're done with the upload. The computer is yours, and we need a readout on the TFM.

SC Okay, that's in work.

CAPCOM Okay, we've got the readout.

CAPCOM 17, Houston. The data looks good and you're go to copy it and recommend you copy it in the Flight Plan supplement. And that's on page 1-43 of the supplement.

SC Okay, Houston. We have it.

END OF TAPE

PAO This is Apollo control we're back live
on air ground now.

CAPCOM And 17, we got that fly by pad now if
your still ready we're ready.

SC Okay, is this a full pad or just a change
to the other one.

CAPCOM Just a change Jack it's a change to NOUN 83
the GET I and the change to the bottom line the GET 05 g just
two changes.

SC Okay, go ahead.

CAPCOM Jack, if you'll just add 2 hours and
40 mintues to each one of them that's it. The GETI is 081
54 43 49. The GET of 05 g 156 04 03. Jack I guess I read
81 I was looking at the old pad it's 83 083 on the GET I.

SC Your too fast for me I was just going to
chew you out.

CAPCOM Sorry about that Jack I got it around
the room.

SC 083 (laughter) 083 54 43 49 156 04 03.

CAPCOM Roger.

SC Okay, Bob we got all of our clocks set
onboard.

CAPCOM Roger, understand.

SC What was the exact amount of that update
time?

CAPCOM 2 hours and 40 minutes 2 plus 40.

SC Okay, 2 plus 40 exactly thank you.

SC Okay, Bob we're going to work up an
appetite with the ALFMED today.

CAPCOM Roger.

SC Hey, Bob maybe a little premature, but
I don't think so, but I think there was some good thinking
into that update looking at the flight plan up until now,
and where we go from here. I don't think we overlooked a
thing.

CAPCOM Roger, like I said the other night we
gave Tommy a gold star on that one.

SC Except I think he and Rita got in cahoots.

CAPCOM A little soon for supper, huh?

SC Yeah, we just finished lunch and it's
about time to eat again.

CAPCOM That's known as the simulator step ahead.

SC Can you give us our distance from the
Earth?

CAPCOM Roger, stand by.

SC Are we about 5 000 miles closer now?

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CAPCOM Don't you wish.

SC Isn't that the way these step aheads work?

CAPCOM Normally, yes but this one didn't work
that way.

CAPCOM Jack, your at 183 000 miles. It's really
amazing how time flys when your interested in your work isn't
it?

CAPCOM Jack, Houston. Did you read my last call
with the distance?

PAO This is Apollo control at 68 hours
1 minute. Apollo 17 is 183 211 nautical miles from Earth.
Velocity is 20521 feet per second. The spacecraft communica-
tor now is Bob Overmyer. Stu Roosa the backup command
module pilot for Apollo 17 is also at the capcom console
with Overmyer.

END OF TAPE

SC Houston, 17.
CAPCOM Go ahead 17.
SC Okay, Bob, we're getting ready for the ALFMED.
I just took red filter and a blue filter picture, two pictures on frame 41 now, with a 35 millimeter. Pictures of the Earth and I took them one stop smaller, that is more open than the light meter said, hoping to compensate for the small Earth. The Earth just barely fills the most inner, the innermost circle of the spot meter. Also, there's a very strong band of cloud, shaped sort of like a narrow fir tree with a base about 20 degrees of longitude west of Baha, California that extends up, I believe, into the vicinity of Hawaii, and the top terminates in a very strong northern cyclone pattern.

CAPCOM Roger, Jack. Was your magazine Sierra, Sierra?
SC That's affirmed. Sierra, Sierra.
CAPCOM Roger, Jack. And you say that cloud is right that cloud area is right near Baha, California? I've got a picture of it here in front of me, from one of the satellites.
SC No, it's about 20 degrees west, longitude degrees west of that.
CAPCOM Yes. Okay, we've got it on the spot here.
SC And maybe even more than that. Okay, maybe even more than that. It's, it might be as much as 40 degrees west and actually Hawaii may be on the west side of that. It's a little hard to tell. It's close enough to the LM that it's hard to say.
CAPCOM Roger, Jack. I think I've got it on our map here. It shows a pretty heavy dense cloud area right now in that area you're talking about.
PAO This is Apollo Control at 68 hours 7 minutes.
ALFMED is Apollo Light Flash Moving
SC For the ALFMED, CDR will be in the left seat, CMP will be in the center seat with the ALFMED. For our reporting when we get the VOX, we'll just call out our first names to shorten it and the comments following. And Jack will be recording.
CAPCOM Roger. We'll be listening.
PAO That's the Apollo Light Flash Moving Emulsion Detector, associated with the visual light flash phenomenon that most crews have reported on past missions, seeing points of light in their eyes, when their eyes were closed. There are a couple of theories proposed on the origin of the flashes. One is that they are caused by cosmic rays. The other is that they are high energy atomic particles which enter the eyeball or ionize upon collision with retina or cerebral cortex. The ALFMED is an emulsion plate device that Ron Evans will wear. It will cover the front and sides of his head and will provide information on time, strength and path of particles penetrating the emulsion plates. The other two crewmen will wear eye shields. This test will last for approximately an hour. And the data on the, recorded by the ALFMED device will be correlated with the crewmen's verbal reports on flash observations.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/9/72 GET 68:11 CST 17:05 MC271/1

SC Okay, wait a minute. Houston, how do you read on VOX with the light weight headset?

CAPCOM Read you loud and clear, Ron.

SC Okay.

SC Yes. Wait a minute. Let me get this little box set to go here, first.

CAPCOM Okay.

SC Yes. Okay, utility power is off. Yes power switch is off. Okay, it's connected now. Okay, utility power is on. Okay. Let me get strapped in here somehow. I'll float all over. Okay, let's see. Uh huh, I can. Okay, my blindfold's going on now. Okay, sounds like big (garble). Okay, somebody will have to help me put this thing on. Just kind of like so. Yes. It goes around the old (garble).

SC You want us to operate now?

SC No, just turn it down a little bit. Go to operate while you're taking the pictures there.

SC Hello, Houston. CDR put his blindfold on at 68:18.

CAPCOM Okay, we copy that.

SC And how do you read me in VOX Bob. This is Gene.

CAPCOM Read you loud and clear, Gene.

SC Okay, I'm conducting the experiment. And the frame Sierra, Sierra is now at 45. I got two shots. Two from the side, and two from the bottom.

CAPCOM Roger. Copy.

SC Hey, looks like a countdown for ready to go Jack.

SC Hey, Bob, does it make any difference if your eyes are opened or closed?

CAPCOM It may be a personal thing, Gene. I, this is Stu, I had to have my eyes closed, but give it either way.

SC Okay, thank you.

SC Okay, we'll count down to start. 3, 2, 1, mark it. It's buzzing.

END OF TAPE

SC Change it. The other side is not very good.

SC Mark, Gene I've got a series of random lines which do not appear to be the width of my field of view that are moving like a flashing horizon with thunderstorms on the horizon. Their dimly flashing and their moving across the eye from left to right and from top to bottom individually. Both eyes. It's stopped now.

SC Mark, this is Gene again going from the upper left to the bottom right lines of the same sort of thing, dimly lit flashing horizon type flashes. But their linear. Their linear and they tend to come from either the upper left or the upper right and work their way downward. Now they've stopped. Both eyes.

SC Mark, Gene again. Both eyes this time the same flashes on the horizon, but they don't seem to be moving out of both eyes. Tend to be up at the tops of both eyes. Just rapid sequential lightening like flashes. They've stopped.

SC Mark, Gene again. Similar type of flashes they don't seem to be moving, but their coming from the right of the right eye and from the upper left of the right eye. And I can actually see an outline of a curved horizon and the flashes are coming out from behind it. They've stopped.

PAO This is Apollo control at 68 hours 30 minutes. Distance from Earth 183 910 nautical miles.

SC And I see peripherally out of my right eye. I cannot see these flashes, but I can see peripherally the right hand and upper right hand side of my right eye being lit up.

PAO Distance 183 920 nautical miles velocity 2 504 feet per second.

SC Pardon? this last one? They were peripherally I couldn't see them all I know is that there was some light out peripherally out but a flashing glow. Oh man, there is a good one the left eye right in the middle it's almost a purple flash. It's still going right in the middle of my eye and it's coming out from behind a horizon that is almost. It starts out as a semicircle and then folds in to a point like on a pencil, and then it disappears. That's the horizon and the light is flashing from behind it. It's gone.

CAPCOM Hey Gene, Houston.

SC Go ahead.

CAPCOM Okay, according to all our experts here the phenomena your describing is pretty much the phosphene effect sort of like when you rub your eyes or squint your

CAPCOM eyes too hard because the effect is lasting too long. The streaks or the flashes that we're looking for are very fast and they do not remain as a scene to your eye. And I guess the only thing we could say would be to maybe either relax your squint a little bit or to put the blindfolds on exceptionally tight. I know this sounds kind of screwy, but those are the words that we would like to say to you but the actual phenomena we're looking for will be a very short lived phenomena it will either be a flash or a very fast streak. Something along this -- we're not trying to load the data, but we feel your describing a different phenomena.

SC Bill we lost all that last conservation you better repeat it.

CAPCOM Okay, Gene, sorry about that and here I thought I had waxed so eloquently. But the effect you're describing is an effect that comes from rubbing your eyes or perhaps squinting too hard, but the effect we're looking for and I guess we're really not trying to load the data, but the effect that we're looking for is a very short lived phenomena and would not -

SC Mark, Ron, I got one in the right eye that's coming from going towards - very narrow streak.

CAPCOM And Gene our only words of wisdom are try to relax the eyes a little bit or if you have the blindfold on exceptionally tight you might work on that. But - I guess sort of relax and see if we can see the other phenomena.

SC Okay.

END OF TAPE

SC Mark, Ron, one about 12:00 in the right eye and looked like it was just a spot.

SC How about 15 seconds ago? It's so dim now I hardly noticed what it was.

SC Kinda started in the left eye and just a flash in the left eye and then a flash in the right eye, very dim. Going left, left to right.

SC Mark. Can't tell if it's right or left eye. Looks like it's almost between the two eyes. There's a mark in the one of the left eye. It's about right in the center. Spot, no streak or anything, just a spot. First spot seems to be between the two eyes. Upper half of the field of view.

SC Mark, Gene, straight from the upper right eye down to about the middle.

SC Mark, Ron, about 8:00, (garble) the diameter out, just a bright flash, it's the brightest flash I've seen yet. Left eye.

SC Just about a second or two after Ron said Mark, I saw a vertical bright line in the left side of the left eye, just flashed. It was the greatest intensity on the last one I had but, the brightness was there but it was kinda dull glow to it. It wasn't. A spot that you could really focus on.

SC Mark, Ron, left eye, about 9:30, half way.

SC Mark, Gene, left eye, very bright spot, left eye, left side about half way in towards the middle.

SC That was the brightest one I've seen and it was just a spot.

SC On the intensity of the last one I had was, oh, a fourth of the bright one I had before that. Spot, yes on the left eye.

SC Mark about 5 seconds ago, about 6:00 in the right eye. Mark, right between the two eyes seemed like. Both spots.

SC Mark, Gene, a sharp line from the center of the left eye to the upper left hand, upper left hand side.

SC Mark, Gene it's a very short, very short line upper left hand of left eye going towards the right.

PAO This is Apollo Control at 68 hours 57 minutes. Apollo 17's distance from Earth is 184 548 nautical miles, traveling at a speed of 2488 feet per second.

SC Mark, Gene, upper right eye, tangential to my eye, just a very short line. Moving -

SC Mark, Ron, oh, a fourth of diameter out in the right eye. Light spot seemed like it was coming in.

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I could see the spot and then the streak, it went from that point kind of in, or up, I guess.

SC Mark, Gene, a dull flash in the bottom inside corner of the right eye.

SC Mark, Ron. Go ahead, Gene.

SC Okay. Correction, Gene. That was on the left eye, that last one?

SC The last ones, for Ron, was at 10:00 and three-fourth of the diameter out, just a, oh, well it was only about an eighth of an inch in diameter, right eye.

END OF TAPE

SC Mark Gene. Mark again, a flash. The first flash was in the left eye and the left side. It went vertically up and away. And following that was a flash in the identically same spot. It was a line flash up and away. On the left side of each eye and it went up in both cases, but they were split by about 2 seconds.

SC Mark Ron. One fourth of the diameter out at 3 o'clock in the right eye. I mean a half a diameter. Half a radius, put it that way.

SC Mark Gene. A flash across the bottom of the right eye coming inward from left to right.

SC On the last one it looked like it was a

SC Mark Gene, just a spot flash in the bottom of the left eye.

SC This is Ron. My last one there was just a spot flash. No direction to it at all.

SC Ron mark. Mark, this is Ron. When I first said the word, it kind of looks like a, almost a sine wave transition from the corner and upper at 10 o'clock in the right eye to about 2 o'clock in the left eye. Right between the two of them. The sine wave with maybe two wiggles in it and it was about a fourth of an inch long. Going from right to left, yes. And going into the left at about 2 o'clock.

SC Turn that music higher.

SC Yes.

SC Mark Ron. Seems like I looked up and as I looked up, there was one in the left eye about 12 o'clock, just a flash. On the outer periphery.

PAO This is Apollo Control at 69 hours 15 minutes. Apollo 17's distance from Earth 184 987 nautical miles. Velocity 2477 feet per second.

SC Mark Ron. Looks to be down about 6:30, just a flash. Right eye. Mark Ron. Left eye, about 3:30 three quarters of the radius out. A very dim flash. About 3:30. Mark Ron. Left eye. Starting at 5 o'clock on the circumference going to 3 o'clock and about three quarter diameter, three quarter radius, I mean. Just a straight line. Did I say left eye? I guess I meant it. Okay, let's see. (garble) It appears the motor quit. Okay.

SC Is that it?

SC Yes, I'll give it to Gene.

END OF TAPE

SC Okay, you want to take a picture of the first one? Okay, stand by 3, 2, 1 mark it, power's on yaw.

SC Say, Bob or Stu.

CAPCOM Roger, go ahead.

SC Okay to add to today. Not last night, but I guess the first night I was in bed I definitely saw some of these. Because I had a hard time going to bed to start with I saw some of the same peripheral horizon type things you said were not the type of data you were looking for, but I also saw some sets of the streaks and probably the one most imposing thing that I remember was - and the last one I remember before falling asleep was the fact that there was a very bright spot that flashed right between my eyes like a very bright headlight like a train coming at you only with a flash. It's difficult probably to estimate the frequency of any of those because I was in a sort of a sleep hazy mode.

CAPCOM Roger.

SC But then as today I saw some that flashed and lit up the horizon and some that lit up peripherally and I guess as you say that's different kind of data, but I did see them there and they impressed me.

CAPCOM Okay, we got all that Gene.

SC Okay, and it might be interesting to know I've never seen it before today.

CAPCOM Hey, Gene we appreciate all the data we were just trying to make the data fit the curve you know the old trick.

SC Okay, I just wanted you to - just tell old Mike we saw them that's all.

CAPCOM Rog.

SC I will say one thing, though, no question in my mind but that they're there. Last trip I took I guess I just wasn't looking for them or paying any attention to them. Maybe they were there and I ignored them because of other things. But they were there.

SC Okay, all you flash bugs down there - flash bulbs I guess is the word frame 50 I just took four pictures to show two on the side and two on the bottom to show the position of the ALFMED and one of them of each set was focused on the ALFMED the others were focused - the other set was focused on the struttts.

CAPCOM Roger, Jack.

SC And when you don't have anything else to do why don't you have somebody predict where the S-IVB is I think I've got her spotted behind us and above us with respect to the Earth and our travel from it.

CAPCOM Item just went out and shot himself, but we'll get working on it.

SC Oh, don't worry about it shoot. I thought you guys might have an idea off the cuff there.

CAPCOM No what's humorous in this Jack is they have really been working on that S-IVB impact point. It's been a real difficult problem for them so far.

SC I'll tell you, I bet you Ron could give a star sighting on it. I looked at it through the monocular and sure looks like the S-IVB.

CAPCOM Jack, we're not doubting you at all we could probably start cranking it right now.

CAPCOM Jack are you all stowing the ALFMED now or are you done?

SC What's that, Bob?

CAPCOM Are you all done with the ALFMED now, Ron?

SC Yes, I've got to get it to, get the plate moved back down there yet.

CAPCOM Okay, Ron.

SC Get the blindfold off first so I can see what I'm doing.

CAPCOM Roger, I just want you to know we've got a real long update coming up to you here on the LOI abort charts and it's probably going to be a difficult read up. And you're the most familiar with the charts you probably would want to take them. But whenever you want to take them they are on charts on page 3-81, 3-82 and then the cue card for LOI limits. Whenever you want to take them it will be a lengthy one.

SC Stand by, Bob let us get squared away from the ALFMED then we will get going on that.

CAPCOM No, I don't want to hurry you, Ron. I just want you to get yourself comfortable and be ready to take them whenever you want them. It's going to be a lengthy time, though.

SC Okay. Hey Bob, I'm looking at what Jack was talking about and it's definitely not a partical that's nearby because there is another one I can look at and get a three dimensional comparison with. It is a bright object and it's obviously rotating because it's flashing. It's way out in the distance as I say because there are particles that are close by and it's obviously not one of those. It's apparently rotating in a very rhythmic fashion because the flashes come around almost on time and as we look back at the Earth it's up at about 11:00 about - oh, maybe 10 or 12 Earth diameters I don't know if that does you any good, but there is something out there.

APOLLO 17 MISSION COMMENTARY 12/9/72 CST 18:15 GET 69:21 275/3

CAPCOM Rog, we don't doubt it Gene and we might work out a set of fumble angles or something here maybe we can get a look at it through the optics.

SC Okay. And I just want to emphasize that's it definitely not one of these particles that tends to look like a star out there something physical in the distance.

SC (Laughter). (Garble). Yes, guess I am.

END OF TAPE

CAPCOM Say, Gene, if you can call up a NOUN 20 so we know the spacecraft attitude and if you can reference the object you're looking at out of your window with respect to body axis and let us look at your - give us a mark somehow and give us your NOUN 20, we can try to get a tie in and start locating the biomed for you.

SC Okay, I'm looking at it out the center window, the hatch window, and I'll give you a hack when it crosses the X, X axis at the center window and I guess it's up maybe 45 degrees.

CAPCOM Okay, give us a hack and we're copying your NOUN 20 right now.

SC Okay, Jack said, pitched up about 30 degrees but ah, yeah, he agreed. It's 45 degrees pitched up and I'll give hack when it crosses the XX axis.

SC Okay mark it, it just crossed through the

CAPCOM Mark, we got it.

SC Let's call it the XZ plane in the spacecraft.

SC One unique thing about it, Bob, is that it got 2 flashes as it comes around in, in rhythmic fashion, you get a very bright flash and then you get a dull flash. And then it'll come around with a bright flash and then a dull flash. That's the SLA end of the S-IVB and then the engine bell, Gene.

SC The Commander doesn't think that I can see the engine bell on that thing, Frank.

CAPCOM Roger, Jack. Is that with the binoculars you're looking at?

SC He couldn't see the engine bell if he had ten binoculars.

SC Okay, I've got the cable restrung now.

CAPCOM Say again, Ron.

SC And ah, Gene, (garbled).

SC Bob, couple of revolutions ago when I was looking at it, I had a much brighter view and I believe I was looking at it broad side. It looks to me like it may be flashing more or less in (garbled) not as bright, although it's getting brighter. But, it's not as bright now as it was a while ago.

CAPCOM Roger, Jack.

SC In fact we've been noticing that I think for about 24 hours or so. I just hadn't put it together as maybe being the S-IVB. I thought it was just some other particle out there.

CAPCOM Roger, Jack.

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SC Hey, Robert, what's the final Cowboy score?
CAPCOM Okay, just an update that the Cowboys won it, 34 to 24. And by winning it they wrap up the wild card slot in the NFC and so both Washington and Dallas will be in the playoffs.

SC Sounds good.
SC Bob, that line of clouds I called a fir tree pattern, that swings up towards Hawaii, Hawaii if you will, has, also has a mushroom pattern on the top. It has the appearance as if two major air masses; one going from west to east and the other from east to west have converged along that line and the joint movement of air at the interface being south to north. And up in the area of Hawaii, I think, it tends to mushroom so the pattern then goes back to a flow from west to east on the east side and from east to west on the west side.

CAPCOM Roger.
SC In a little while we'll probably get a pretty good look of a - what looks like a very concentrated intense storm that I think, is just, just east (garbled)
SC (garble) and then we'll put them, once we get update a little bit.
SC Okay I'll get out of VOX in a minute.

END OF TAPE

SC I hope we get to the Flight Plan and stuff. And the little books.

SC Say Bob.

CAPCOM Go ahead.

SC Houston, 17. How do you read?

CAPCOM Go ahead, Jack. Read you loud and clear.

SC Okay, Bob you want to update the LOI card and Flight Plan 382 and 381, is that right?

CAPCOM That's affirmative.

SC Which one do you want to start on?

CAPCOM I would say 381 is the most difficult one to start on.

SC Okay, in that case, why don't you start on the board, on the cue card?

CAPCOM Okay. We can start on the cue card. Your druthers.

SC Yes. Go ahead. I'm ready.

CAPCOM Okay, on the LOI limits, the V go column, let's go right down the V go column, I think that would be the easiest way to do it. Where it says V go 2980, change that to 2986.

SC Why don't you just keep going?

CAPCOM Okay, the next one going straight down the line, 2721, 2521, and 2316. That's all the changes on the V go line.

SC Okay, and all those changes were in mode one?

CAPCOM That's affirmative.

SC Okay, I got 2986, 2721, 2521, 2316.

CAPCOM Roger. Now, under the burn time column, the first one opposite the 2986, the burn time remains the same. Do not change that one. The next one changes 0 plus 40.

SC Which one is that Bob? I missed you.

CAPCOM Okay. Where it says 0 plus 28, change that to 0 plus 40.

SC Okay, press on, threw them all out.

CAPCOM Change the 0 plus 53 one to 1 plus 10. Change the 1 plus 31 to the number 1 plus 40. Over.

SC Okay, I got, in order, burn time, 0 and then 0 plus 40, 1 plus 10, 1 plus 40.

CAPCOM Roger. V measured column, the first one, the zero does not change. The next one, in this order: 265 465 and 670. Over.

SC Okay, I got 0, 265, 465, and 670.

CAPCOM That's affirmative, Gene. That's the changes to the LOI limit cue card.

SC Okay, Bob, I think we got all that. I

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SC guess Delta V measured down there in the bottom 2980, should be 2986, huh?

CAPCOM Roger. We felt that wasn't, that is correct. To be technically correct it should be 2986 at that last one.

SC Okay, I guess we're coming in just a skosh hotter, huh?

CAPCOM That's affirmative.

CAPCOM You'll see from the curves that we going to have to update, that you're a lot closer to the free return trajectory.

SC Okay, why don't you go ahead on 381?

CAPCOM Okay, this is the tough one. The first thing we're going to do is prod a couple or three points here in the Mode 1 2 hour, the Mode 1 2 hour line changes also. So you might want to draw a line at a LOI Delta V DBM of 265, 265 and draw that straight up the curve. That'll be the no, the new

SC LOI Delta V magnitude DBM of 265, huh?

CAPCOM Roger. That will be the crossover point to the Mode 1 2 hour to the Mode 1 30 minute.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/9/72 18:41 CST 69:48 GET MC278/1

SC Bob, are you there?
CAPCOM That's affirmative. Go ahead.
SC Okay, Bob, I've got two 65 vertical lines
drawn and I expect I can extend the MODE 12 hour abort to that limit.
CAPCOM That is affirmative, Gene.
CAPCOM Now you're going to have a new curve so
don't bother to draw on the old curve. We're going to give
you three points to plot and draw a straight line between
'em that will create a new curve.
SC Go ahead.
CAPCOM Okay. The first one is at, the point is
defined with a DELTA VM zero and abort DELTA B of 1525, 15 25.
SC Okay.
CAPCOM The second point is defined by a DELTA VM
of 1 5 0 an abort DELTA V of 1 8 1 0. Over.
SC Bob, that last 1810.
CAPCOM That's affirmative.
SC Okay. Got it.
CAPCOM Okay, and the last point is defined by
DELTA VM of 2 6 5 and abort DELTA V of 2 1 0 5.
CAPCOM The curve defined by those three points will
be your LOI plus 2 hours abort DELTA V.
SC Okay, that last point is just the DPS
available curve with 2 6 5.
CAPCOM That's affirmative.
SC Okay, it's drawn in.
CAPCOM Okay, now we got a curve one.
SC --- guess at 2.
SC Okay, go ahead.
CAPCOM I'm sorry I cut you out. Did you have some-
thing else you want on that?
SC No, it's good. I curved it.
CAPCOM Okay. Curve 1 is two points defining
it. The first one is DELTA VM of 2 6 5 abort DELTA V of 1 8 5 5.
SC Okay.
CAPCOM And the second one is a DELTA VM of 4 0 0
abort DELTA V of 2 0 6 5.
SC Okay.
CAPCOM Okay, those two points form the curved
one of the MODE 1 30-minute.
SC Okay, I got it.
CAPCOM Okay now, curve 2 has three points defining
it. The first point is identical with the end point of
curve 1. It's 4 0 0 on the DELTA VM and 2 0 6 5 on the
abort DELTA V.
SC Go ahead.

APOLLO 17 MISSION COMMENTARY 12/9/72 18:41 CST 69:48 GET MC278/2

CAPCOM Okay, the second point is 5 3 0 for the
DVM and 2 2 4 5 for the abort DELTA V.

SC Okay.

CAPCOM And the last point is DVM of 6 7 0 and
a DELTA V, abort DELTA V of 2 4 7 5.

SC Okay.

CAPCOM Okay, and if you draw a line up the page
at the DVM of 670. That is the end of the MODE 1 30-minute
and everthing to the right of that you are in MODE 2.

CAPCOM Gene, Houston.

SC Standby, Bob.

CAPCOM Roger.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/9/72 CST 18:52 GET 69:59 MC279/1

SC Hello, Houston. Are you reading yet?
CAPCOM Roger, go ahead.
SC Okay, Bob, curve looks good. I just checked the dipback crossover on the dips available, and it comes out with what you gave me on the card, about 2521.
CAPCOM Roger. And, just one minor point. Across the top on the block you began you can bias all those numbers -- add a six to every one of them across the top to be technically correct.
SC Okay.
CAPCOM The next reading we have on that -
SC (Garble) correct, I could have done that before I -- before I plotted the curve, but that's good. We understand, and we got it down.
CAPCOM Okay, the next thing I've got is that whole update column in the little block there is all updated, and we probably ought to get a readback on all these numbers, Gene. I can give it to you right like a regular pad just from the right down to the top to the bottom, and then read it back to me. I think that'll be the best way, don't you?
SC Okay. Ron's going to go ahead and take them, and we'll double check them, and he'll read them back.
CAPCOM Okay.
SC Okay, just go ahead and start at the top and go down.
CAPCOM Okay. I'm starting at LOI ignition time. 885426.8. Pitch is minus 43, yaw 112. GET abort ignition 892426.8, roll 217, pitch 6, yaw 25. Minus 42 on the pitch, 110 on the yaw. 216618. High gain angles again. Minus 75, yaw 250, GET abort ignition there 905426.8 1531719. Next time there is GET abort ignition for the LM at the A angles there -- 905426.8, roll, pitch and yaw angles, 202; 29; 330. Over.
SC Okay, Bob, here we go on readback. Let's see them right down the line. 885426.8 minus 43112, 892426.8, 217625 minus 42 110 216618 minus 75250 905426.8, 1531719, 905426.8, 202, 29, 330. Over.
CAPCOM Roger, Ron. Real good readback. On the next page, on page 382, the data there is exactly the same as the LOI limit cue card to changes. We can read it up to you individually, or you can take it from your cue cards, your choice.
SC No, we'll change it from the cue card.
CAPCOM Okay.
SC Bob, since they won't let me write anything, I tried looking for the Moon near the Sun with the filters and could not see it.
CAPCOM Roger.
SC You sure you're sending us to the right place?

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CAPCOM Roger, Jack. Hey, I've got some information on that SIVB that you're looking at. The azimuth was within 1 degree of what you called when we checked out on your angles.

CAPCOM Hey, Jack. Houston.

CAPCOM 17, Houston.

SC Go ahead, Bob.

CAPCOM This was for Jack and Gene. The trench has computed the SIVB location in reference to your body axis, and the azimuth was within 1 degree, very close, and the -- we calculate it should have been out of that window at 62 degrees from the X-axis, and you reported 45 degrees, which is just a 17 degree error is real close there. You know, just eyeballing it like that.

SC That's great. Then, that is the SIVB, huh?

CAPCOM Okay. Well, we -- you might check it this way, Jack. Line up the star Deneb Ola and Rigel. Say again, Regulus, I'm sorry, Regulus. Deneb Ola and Regulus, and then, on that line, go perpendicular to that line right above Ri -- right above Regulus, and that should be the SIVB. It forms one point of a right triangle with Deneb Ola and Regulus.

SC What you're saying is it's the eye of Leo the Lion.

CAPCOM That's affirmed.

SC Except, we can't see Leo the Lion very well.

CAPCOM Okay.

END OF TAPE

CAPCOM And 17, Houston.
SC Go ahead.
CAPCOM We've got a rather lengthy flight plan update series here. We can read up to you anytime you want. Just a reminder that we are sitting here waiting with it. Your call.
SC Generally what is it, Bob.
CAPCOM It's changing a number of attitudes all through the flight plan, 84 32, 84 35, changing VERB 49 maneuver, things like that due to the TLC change here on times and that.
SC Okay, where are you going to start?
CAPCOM Okay, at that 8432, standby one. Ah, Jack, Flight just told me we can wait on this if you want until some other time in the flight plan. We want to get into this experiment checklist with the pan camera, mapping camera film cycling. Or we can do both of them concurrently.
SC Hey, Bob, let's get the camera cycling out of the way first and then we'll pick up the flight plan update.
CAPCOM Roger, we concur with that.
SC Okay, Bob, I'll get to that camera, just a second. The coast of Australia is starting to come into view. Still looks pretty clear. Will give you more on that later probably. That cyclone I talked about yesterday in the vicinity, I believe, of the Solomon Islands, looks even better organized than yesterday. It's really tightening up. Starting to look very bright and dense right in the core, not to dissimilar from Therese. Although, has a little broader extent in the southeast quadrant.
CAPCOM Roger. Read that.
CAPCOM Trying to match that up in my prog here, I can't find it.
SC Well, you didn't have it there yesterday either. It certainly looks like a tight little storm now though.
CAPCOM Roger, I understand.
CAPCOM Jack, would you mind repeating that location of that.
SC Can't give you must on the progress --
SC Well, I'll try to give it to you a little better later. It's the one I was talking about yesterday as being in the vicinity of the Solomon Islands. That's somewhat east, southeast of New Guinea.
CAPCOM Yeah. Roger. I've got it.
SC I think before we go to bed we'll probably be able to update the progress of the, that front south of Australia also.

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CAPCOM Roger. I've got a pretty disorganized area to the east of New Guinea. It's probably right over the Solomons. Looks pretty disorganized on our satellite photo. From, let's see, I guess that was this morning sometime.

SC Well, there is a lot of cloudiness in the Equatorial regions, inner-tropical convergence zone in there. This is south of that, sort of. I'll talk to you later.

CAPCOM Roger.

SC Houston, how do you read 17?

CAPCOM Loud and clear, Jack.

SC Okay, S-band AUX TB to science, mark it.

SC Okay, SMAC is coming on. Mark it.

Mapping camera to standby. Mark. Pan camera power is: power, barber pole, book grey, self test is to heaters and you want the high gain?

CAPCOM That's affirmative. Minus 50 on PITCH and 270 on YAW.

SC Okay, there she is all locked up. PCM rates going high.

CAPCOM Roger.

SC Okay, when you're ready, I'll do the big deal here.

CAPCOM Roger, standby for my cue on that, Jack.

CAPCOM Okay, Jack, we're ready.

SC Okay, mapping camera, mapping camera is ON.

CAPCOM Roger, we mark it.

SC Okay, and pan camera, self test, going self test. Got a barber pole.

END OF TAPE

SC And the pan camera self test or talk back is gray.

CAPCOM Roger, we'd like reacq on the high gain check.

SC You got it.

CAPCOM Thank you.

SC Sorry, I didn't read the check list.

SC (garble) cameras off.

CAPCOM Jack say your last.

SC Mapping camera went off at 2 minutes and the pan camera power is off.

CAPCOM Roger, and we'd like to select your checklist angles now on the high gain, please.

SC Okay. Okay, you want those on the dial you don't want me to try to acquire there do you.

CAPCOM That's affirmative.

SC Okay, smac power is going to come off here now.

CAPCOM Roger.

SC Okay, smac power is off and how is my ZPN doing?

CAPCOM Jack, say again your question please.

SC This is Ron how is my ZPN doing?

CAPCOM Oh, roger let me take a look here. Hey, Ron, we don't want to say it's bad, but we're glad your talking to us because we want to make sure your with us.

SC Okay somebody did listen a little bit then.

CAPCOM Roger, we think we've got a bad skin sensor in her face here Ron.

PAO This is Apollo control at 70 hours 26 minutes. Apollo 17's distance from Earth 186 663 nautical miles, velocity 2 436 feet per second. This is Apollo control at 70 hours 27 minutes. We have another update on the S-IVB stage. Impact time and coordinates predicting an impact time of 89 hours 39 minutes 38 seconds at 4 degrees 21 minutes south, 12 degrees 12 minutes west.

SC Bob, how do you read 17?

CAPCOM Read you loud and clear, Jack.

SC Okay, that storm I'm talking about a little more precisely is maybe centered at 2 degrees latitude north of the Solomon Islands.

CAPCOM Yeah, that kind of matches up Jack. Does it look like New Guinea and that is pretty well clobbered?

SC No, not really New Guinea is at the western edge of a cloud zone that is part of that intertropical convergence zone that starts at New Guinea and swings east north east in an arc for about half the visible Pacific and then that arc crosses back down over the equator and heads generally toward central America. I suspect, although, that's beyond the

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SC terminator now. The storm I'm talking about is clearly south and separate from that inter-tropical convergence cloud pattern.

CAPCOM Roger.

SC It's getting very tightly wound and the clockwise sense, and - and it's just where there was a less well organized pattern yesterday. Although, maybe it has moved northward a little bit.

CAPCOM Roger, we understand Jack.

SC Our zero zero phase point Bob is about 10 degrees - make that 15 degrees longitude east of the Solomons and has a - is a fairly low intensity at this time. I'll keep an eye on it as it approaches that storm area and see if it changes. Okay, Bob just one last thing on that line of clouds that stretches up toward Hawaii they look very thick and dense based on the structure you can see as the terminator approaches them. They cast a pretty strong shadow to the west.

CAPCOM Rog, I see those on our satellite photo. They look pretty thick in there. I'm strictly an amateur talking to you Jack, but looks pretty thick in there.

SC Yeah, right.

SC How about some flight - when you come around again can you start the flight plan updates.

CAPCOM Any time you want them I can start them.

SC Go ahead.

CAPCOM Okay, the first one is at 84:32 in the flight plan.

END OF TAPE

SC 8422. Go ahead.
CAPCOM 8432. 32. Add the following. Roll right 12 degrees. In parenthesis, to a roll of 150. The purpose of this change is to avoid.
SC Say again the. Say again the number in parenthesis.
CAPCOM R roll of 150. 150.
SC Okay, at 8432 roll right 12 degrees to roll 150.
CAPCOM Roger. And in parenthesis here, just a comment, it's to avoid gimbal lock during verb 49 maneuver directly below it.
SC Okay, go ahead.
CAPCOM Okay. At 8435, the verb 49 maneuver, change the attitude to roll 320, pitch 010, yaw 324. And we want the high gain antenna angles: pitch minus 29, yaw 17. Over.
SC Okay. 320, 010, 324. High gain, pitch minus 29, yaw 17 and that's at, that's for the verb 49 maneuver at 8435.
CAPCOM That's affirmed. And it goes without saying scratch out OMNI alpha there.
SC Got you.
CAPCOM Okay, the next one is at 8542. 8542.
SC Go ahead.
CAPCOM This is just a couple of notes here. The P52 stars we got in the CMS are 16 and 17. Gyro torquing will take 10 minutes 47 seconds. 10 minutes 47 seconds.
SC Okay, the stars will be stars 16 and 17. Torquing will take 10 minutes 40 seconds. 47 seconds.
CAPCOM That's affirmative, Jack. Okay, at 8544 over there on the right where it says LOI REFSMMAT attitude change that roll 064, pitch 135, yaw 005. Over.
SC Okay, got you. Change is to roll 064 pitch 135, yaw 005.
CAPCOM Okay, Jack, I'm going to take a break here, and you can go ahead and secure the high gain and go into the OMNI Bravo, and call me when you're ready for some more of these.
SC Okay, go ahead.
CAPCOM Okay, Jack. The next one is an addition at 86 hours. We just want the following words. Manually pressurize SPS. Over.
SC Go ahead.
CAPCOM Okay, did you get that last one, 86 hours.
SC Roger. 86 hours, manually pressurize the SPS.
CAPCOM That's affirmative. And just for your infor-

CAPCOM tion, that's because we need a couple hours of data on it. Like to look at it a couple of hours prior to LOI. Okay, the next one's at 8720.

SC Go ahead.

CAPCOM Okay. Where it says manual roll left to 30 degrees, change 30 degrees to 63 degrees. 63 degrees. Change the roll angle from 050 to 001.

SC Okay, that's roll left 63 degrees and the roll is 001.

CAPCOM That's affirmative. And the new high gain angles will be pitch minus 27, yaw 339.

SC Okay. Minus 27 and 339.

CAPCOM Okay, just a little bit below that at where it, about 8727 or 8730, where it says manually roll right 30 degrees, change the 30 to 63. 63. Change the roll to 064.

SC Okay, roll right 63 degrees. Roll will be 064.

CAPCOM That's affirmative. And scratch out OMNI alpha and add high gain antenna pitch minus 29, yaw 17. Yaw 17.

SC Okay. High gain pitch minus 29, yaw 17.

CAPCOM Roger, Jack. And the next one is over at 8903. We've got a COMM attitude.

SC Okay, 8903.

CAPCOM Okay, that attitude there should, it's pretty close. Roll 165, pitch 060, yaw 338.

SC Go ahead, Bob.

CAPCOM Did you get that last, the attitude change, it's real trivia change, we probably shouldn't have called it, but it's 165 060 338.

SC 8903, excuse me.

CAPCOM Roger. Did you get that attitude at 8903?

SC Repeat 8903.

CAPCOM Roger. Roll 165 pitch 060, yaw 338.

SC Okay, 165, 060 338.

CAPCOM Roger. That's

END OF TAPE

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SC Okay. New COMM attitude, 16506060338.
CAPCOM Rog. That seems hardly worth it on that, Jack.
Sorry on that one. Just one last note, a general note, on all
this we gave you. Everything has been checked in the CMS. You
probably figured that anyway.
SC Roger. Always know those fellows are working
with us.
CAPCOM Roger. And, Ron, we've got good data on you
now.
SC Is that it?
CAPCOM That's affirmative, Jack.
SC Okay, thank you Jack.
SC Bob, Gene just told me I may have confused
you on the clouds that I told you I could see near the terminator
with a good shadow -- the shadow's on the eastern side as the
terminator approaches.
CAPCOM Roger.
PAO This is Apollo --
CAPCOM How do you read, 17?
SC Read you loud and clear, Jack.
SC Okay, I mentioned earlier, I can't remember
exactly when, that it looked like the pattern of water in the
Ross Sea or clear areas within the Ross Sea ice packs had changed,
and I feel more strongly about that now. It looks like it's
opened up considerably. The tri -- long -- elongated triangular
areas, two of them that were there a couple of days ago seem to
have merged, and you also have clear water along most of the
inner portion of the shoreline of that Sea.
CAPCOM Roger. Must be getting towards summertime
down there.
SC Well, I'm very surprised that it's changed
shape as much as that, and it could be that that triangular pat-
tern was caused by a cloud bank that split what is now open
water, and made it look as if it was icepack.
CAPCOM Rog, understand.
SC Hey, Bob, can one of the guys there give me
a hack on when the terminator should cross Hawaii?
CAPCOM Roger, we'll look it up.
SC Do it in either GET or CST, either one.
CAPCOM We'll crank it up to you in GET.
PAO This is Apollo Control. It's 70 hours 53 min-
utes. Apollo 17 is now 187 288 nautical miles from Earth. The
spacecraft velocity is 2421 feet per second.
CAPCOM Ron, we missed a NOUN 05 in there. Can you
give us a NOUN 05?
CAPCOM Ron, Houston. We missed the NOUN 05 on
the data -- can you give us what your NOUN 05 was?

SC Would you believe 5 balls?
CAPCOM Oh, I'd believe that.
SC Okay.
CAPCOM Go ahead and talk, Ron.
SC Roger, roger. We'll talk at 30 -- 5430.
CAPCOM Jack, Houston.
SC Go ahead.
CAPCOM We've been listening to the playback of the
DSE tape from the ALFMED period, and all three of you sound
pretty good on that. Gene is still clearer than the rest, but
all three of you sound real clear and very readable.
SC Excellent. That'll make up for my note-taking.
CAPCOM Roger.
CAPCOM And, also, Jack. You had a question earlier
about different response of sea and continental areas when viewed
through monocular polarizing filter, and I've got a note here
from John Dietrich that kind of explains it.
SC Okay, let's hear what John has to say.
CAPCOM Okay. This is pretty much referencing the
time you were looking at it, and here it is. "Ocean scenes near
the bright area off Bolivia, which is the specular point, include
a high proportion of polarized light. The spacecraft, Earth, Sun
geometry now is approximately equal to the Brewster angle which is
nearest 53 degrees where maximum plane polarization due to reflec-
tion occurs. Therefore, a high response of scene brightness to
changes of filter position can be expected. Continental scenes
are dominated by Lambertian or diffuse reflectors which are
characterized by low proportion of polarization in the reflected
beam. For such scenes, changing position of the polarization
filter produces changes in scene brightness that are near or
below the threshold of detectability." Over.
SC Okay. That sounds very good. It's sort of
like the contrast between the lunar surface response the oceans
being more like that, I guess, and between the lunar surface and
terrestrial land surfaces.
CAPCOM Roger, Jack.

END OF TAPE

SC That's very good very interesting. Thank John for me. I should have thought about that, but I've been away from it too long.

CAPCOM Okay, terminator over Hawaii at 73:45 GET.
SC 73:45 thank you.

PAO This is Apollo control at 71 hours 2 minutes. Apollo 17's distance from Earth now 187 507 nautical miles, velocity 2 416 feet per second. On Monday 80 foreign students who are touring space research science centers in the United States will begin a three day visit here at the Manned Spacecraft Center. They will observe the three periods of lunar exploration by astronauts Cernan and Schmitt and will also tour the facilities at MSC. This International youth tour began December 2 in Washington D.C. and is being conducted under the auspices of the National Aeronautics and Space Administration with the cooperation of the state department. The student group saw the Apollo 17 launch at Cape Kennedy and since that time have toured the Tennessee Valley Authority and the Oakridge National Laboratory facilities in Tennessee. Today they're at the NASA Marshall Spaceflight Center in Huntsville, Alabama tomorrow they will tour the National Oceanic and Atmospheric Administration and the National Bureau of Standards in Boulder, Colorado. The students were selected by their respective governments in response to a NASA invitation, and they range in age from 15 to 17 years and rank high academically and have strong scientific interests. Following their visit to Houston the group will tour the NASA Ames Research Center at Moffitt Field, California and the jet propulsion laboratory in Pasadena, California. Schedules for the visit here at MSC and a complete list of the participating students, and countries may be obtained at the MSC news center. At 71 hours 5 minutes this is mission control, Houston.

SC Houston 17 how do you read?

CAPCOM Go ahead. Read you loud and clear, Jack.

SC Roger, Gene and I are going to stir your cryos for you.

CAPCOM Okay, we'll be watching for it.

SC Okay Houston Apollo 17 here, we have canister number 8 in the bravo.

CAPCOM Roger 8 in the bravo. We got it. You made EECOM happy tonight there Ron.

SC Okay, and I'm still looking for my scissors.

CAPCOM For your what?

SC My scissors.

CAPCOM What did you do misplace them or do you want me to look up and see where they're supposed to be?

SC No, they were stuck in the hand controller number 1. The little thing you're supposed to put the LM belt things in there. It was stuck in there last night when I went to bed and I got up this morning and it was gone.

CAPCOM Scissor, scissor, who got the scissor.

SC (Garble) you wanted to get up.

SC Yes.

CAPCOM I've got a feeling they're still with you somewhere.

SC All sorts of things happened on his watch.

SC Yes, we won't talk too much about that.

SC Houston are you watching my EKG?

CAPCOM Say again Ron, we missed that.

SC Roger, are you watching Ron's and my EKG?

CAPCOM Roger, let me punch the surgeon here.

SC We were doing a little bit of exercise.

CAPCOM Oh, we can see that in the cyros we know you're doing exercises. Let me go up and get the numbers here. Jack's at a 120 on the heart rate.

SC Okay.

CAPCOM And, Ron, you're about 90.

SC Okay.

CAPCOM And, Jack, guess you can pass the word to Jack we refined that Hawaii terminator number through the Pacific Fleet and call it all around it and actually it's at 72:55 GET.

SC Okay, 72:65 GET.

CAPCOM No, 72:55, 55.

SC Roger, 72:55.

END OF TAPE

CAPCOM Okay, Jack. We got you at 130 right now.
SC Okay, Houston, this is LMP, what was
the last number you saw on my heart rate?
CAPCOM Okay, you peaked at 135 and we had you
130 for several minutes.
SC Okay.
CAPCOM Jack, just for interest, in that time
you got banging around so hard, you caused the heaters in the H2
to shut off. The pressure went up until the heater shut
off.
SC Well, that's what you wanted, wasn't
it?
CAPCOM That's affirm.
SC Good thing, there's not another mission
or we'd have to flight plan this kind of thing for your
EECOMS.
CAPCOM That's right. Got to conserve at all
costs.
SC Who's sitting on your right tonight?
CAPCOM Got a big Moon over there.
SC He's always there, isn't he.
CAPCOM Roger.
SC Say, Bob, I took another picture of the
Earth and forgot to give you the GET on it. That was about
15 minutes before the end of the ALFMED experiment. If you
can go back that way.
CAPCOM Okay. Let me see Jack. The last thing
we had was right about the end of it. We had you in Sierra,
Sierra frame 50. And you had four pictures then. Is that
before that or after that? Okay, those four were for the
ALFMED, weren't they?
SC That's affirm. No, this was with the
Hasselblad, the EL camera.
CAPCOM Oh, okay, got you. We had FTO working
on matching that one up.
SC Okay.
SC Houston, 17.
CAPCOM Go ahead Jack.
SC Roger, that weak front that I talked about
south of Australia yesterday has moved north, but it looks
considerably weaker than it did yesterday, even. Just a
very thin line of clouds, very thin line of clouds that now
is touching the tip of Australia (Garble)
SC Houston, 17. I think maybe you dropped
out, before I said that little weak front moving north
northeast south of Australia. The western end of it is
just touching the coast of Australia, south of Perth,
but it looks much weaker, and I, right now, would not expect

SC very much weather out of it.

CAPCOM Okay. That, I can't tie up with you on that one, Jack, because my prog doesn't go down that far. It only stays up in the landing area. And my satellite photo doesn't go down that far south either. So, I can't touch up with you on that one.

SC Okay. Well, it looked (garble) stronger yesterday and it might develop. Now, there is a larger disturbance in the southeastern end of that front. Still south of Tasmania, although I suspect unless it stays on a pretty northerly course, it will not effect the weather on the east coast of Australia very much.

CAPCOM Roger. Jack, just thought you might be interested. I called some friends of yours in Tucson and everybody's fine there and wanted to say hello and tell you everybody's fine and getting along real good.

SC Thank you very much. Good to hear. They've learned to take care of themselves pretty well, haven't they.

CAPCOM They sure have. They're having a little trouble with the squawk box, and we'll get working on that. They're having trouble reading a little bit, but they're keeping up with us.

SC That's nothing new. But, try to fix it please.

CAPCOM Oh, we'll definitely on that one.

SC Bob, Ron got you the Earth down there zeroed in the sextant, and it puts my little binocular to shame. I tell you it's a fine instrument. And I'll just confirm that the disturbance over the Solomon Islands is an awfully tightly wound little storm system, and right now, I finally have seen New Zealand for the first time in a couple of days for sure. And the South Islands got some probably high cirrus over it. North Island looks pretty clear. That's the end that I can get right now.

CAPCOM Roger. We thought you were looking at Regulas, didn't realize you were looking at the Earth instead.

SC Ron's been looking for the booster. And he called me down and asked me to look at the Earth. He's been holding out on me.

CAPCOM Roger.

SC Pass the torch of weather forecasting to Ron.

CAPCOM Hey, Jack. I also have some words for you and Gene. Got some advice from the home front the thing to do with Ron in the future is to hook up a

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CAPCOM Baby Ben and a metal dish pan, it works
every time, if you want to wake him up.

SC No. I think that's not a good way.

END OF TAPE

CAPCOM Ron, everybody's fine over at El Lago. They are doing great. Listening at every word.

SC Very good, Bob. Thank you very much.

SC Hey, Bob. We got two of those flashers out there. They could be SLA panels. I don't know. They're a like in intensity and pretty regular in the intensity bright and dim flashes they come out with and they're widely separated. One is about the position we called at the first time; the other one is, oh, as I'm looking at the Earth, far to the left. Closer to the center window now.

CAPCOM Roger.

SC Houston, 17.

CAPCOM Go ahead.

SC Yah, Bob, what is your analysis chart that you haven't, terms analysis chart show for Hawaii today.

CAPCOM Standby on that.

CAPCOM Jack, according to the ---

SC --- is that using your chart

CAPCOM Go ahead on that, Jack.

SC I was going to say, using your terminator time as a partial mark for where Hawaii ought to be, Hawaii ought to be, it looks like that cyclonic circulation at the north end of the cloud bank I described approaching that area, would be just about on the Hawaiian Islands. I'm curious if they're getting some weather down there now.

CAPCOM Standby, right now I've got my weather-man right beside me here.

SC Also that major front we talked about last night as being east and south of Japan, it's progressed even farther and is, oh, maybe 20 degrees longitude, about 20 degrees longitude from the Hawaiian Islands and I'm making some guesses on exactly where Hawaii is.

SC Roger, Jack, we've got nothing adverse in the Hawaiian area at all. Just a lot of wind, high wind, surface wind, surface roughness, but we don't have any bad cloud area in the Hawaiian area. I'll get the Hickam sequence report here shortly, Jack.

SC Okay, I don't know, maybe I, our zero phase point is now centered just a little south of the disturbance near the Solomon Islands, and I see no distinct change in the intensity of that zero phase point over what I had talked about a couple hours ago.

SC Roger, Jack. The Solomons Island disturbance center is confirmed on this chart that I've got. It's very definitely confirmed in there.

SC Okay. Well it's a lot more obvious today than yesterday; but even then it was showing a pretty strong circulation. It is starting to wrap up. Look very much like

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Therese did yesterday.

CAPCOM Roger, I'm sure of that. The one right off of Vietnam is also pretty tight, isn't it still.

SC Well, we can't see that one yet.

CAPCOM Okay.

SC Australia generally is still very clear except in the northeastern portion where it looks like they have got scattered clouds; but it looks like a pretty night - over Australia.

CAPCOM Rog. Looks that way from the satellite photo from the last couple days. Looks pretty nice down there.

SC Right.

PAO This is Apollo Control at 71 hours 46 minutes. Weather reporter, Schmitt, is 188 524 nautical miles from Earth and the spacecraft from which he is observing is traveling at a speed of 2392 feet per second.

CAPCOM Jack, in looking at the sequence reports for Hickam and Hilo and that area, it looks like they just got their standard 3500 scattered, 4500 broken clouds, maybe a rain shower or two. But just their standard tropical fluffy cloud.

SC Ah, Houston, Apollo 17.

CAPCOM Go ahead, Ron.

SC Ah, Bob I don't know whether I told you or not, but, we ended up with the LMP and the CDR's suit in the bottom of the suit bag. My suit is in the top and I sure don't have any idea how in the world the other crews got three suits in there. I guess they never did because these things are plum full right now, of suits. In the suit bag and it's a good thing we lengthened them. I don't have room for anything else inside the suit bag. The water bag and, you know, the contingency water bag and my G suit and those flight things I found a place to stick them all around the wall on the outside of the suit thing.

CAPCOM Roger, Ron. Good work.

END OF TAPE

SC Bob, you made some comment earlier about the weather it may have been Hawaii, but you broke up.

CAPCOM Roger I just got the sequence report for Hawaii. Hickam had 35 hundred scattered 45 hundred broken with minor rain showers and Hilo had about the same and basically it's just their tropical pumpy weather out there. Typical - nothing no frontal type weather or no cyclonic type weather.

SC Okay, well it may be just patterns induced by the wind currents or maybe I don't have the position of Hawaii quite right.

CAPCOM Well, it's possible they do have high winds out there and I've seen it just flying in that area in the past where those broken clouds get pretty close together at times it almost looks like a solid overcast. And especially when you look at it from an angle they all blend together.

SC I hope your going to save all those charts your gathering together as we talk about it on this outbound leg. Be interesting to compare them and the pictures we take sometime in January.

CAPCOM Jack the weather just was out here and they told me that's exactly what their doing and if your time will permit in January they'd like to go through and maybe help piece them all together. But, they're going through these transcripts and they're gathering all their satellite pictures plotting what your seeing versus the satellite pictures etc. etc. and they'd like to go over it with you when you get back.

SC I'd love to do that. I hope in general we're getting the directions right at least I know I'm going to worry about the description and it's hard to place points on the globe particularly in the Pacific if you can't identify land masses near them or have those nice little latitude and longitude lines painted on the Earth.

CAPCOM That's right. We'll put in a request for some lat and long lines out there.

CAPCOM Jack, we're going to have a slight change over from goldstone to honeysuckle at 72 hours so we will probably break up.

SC Okay, Bob you know youre just the last turn or so you started to break up occasionally as if you might be getting a bad mike button or something.

CAPCOM Okay, I'll check it out.

CAPCOM 17 Houston through honeysuckle how do you read?

SC You're loud and clear Bob.

CAPCOM Roger, sameo sameo.

SC Houston 17.

CAPCOM Go ahead.

SC I just played with the polarizing filter again and it looks as if when you have the knob on the filter parallel to the, - roughly parallel to the polar axis of the Earth you get maxium darkening and of course the opposite 90 degrees to that you get maximum lightening of the globe. And in the case of Australia it also appears to lighten and darken, but not to the extent of the ocean areas.

CAPCOM Roger.

SC You could be in the more desert climate you get finer grain material on the ground and give you the response that John Detrich had talked about.

CAPCOM Roger.

SC Houston, 17.

CAPCOM Go ahead, Jack.

SC I rechecked that little story I was trying to give you about the ice pack there in the Ross Sea.

CAPCOM Roger.

SC And whether I was right a couple of days ago or not - whether I was right a couple of days ago or not in the patterns right now there is a lot of open water between the ice pack and the inner or let's say southern and south eastern shore of the sea that I don't recall being there the other day.

CAPCOM Roger.

SC I don't know whether any of you have any connections with all the Marine stations in Antartica, but maybe somebody knows what the ice packs been doing the last few days.

CAPCOM I'll see if we can find out, Jack. I don't think we've got any gauge in Antartica, though.

SC Well that way you can't loose any.

CAPCOM Right. Well, they never stole the continent.

SC Sounds like pretty good duty, Bob.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/9/72 CST 21:06 GET 72:12 MC288/1

PAO This is Apollo Control at 72 hours 14 minutes. Apollo 17 now 189 167 nautical miles from Earth, traveling at a speed of 2377 feet per second. And, we're just over an hour away from the time that Apollo 17 will enter the lunar sphere of influence. Flight Dynamics Officer, Bill Boone, has recomputed the time for that event. That will occur at 73 hours 17 minutes 45 seconds.

SC Houston, 17.

CAPCOM Go ahead, 17.

SC Yeah, I -- may have misled you earlier about a storm system south of Tasmania. Its -- if there is one, it's just developing, and it's probably 20 degrees longitude south. As I recall yesterday, there was some indication that a couple fronts were joining forces and moving in that direction. Today, the weaker and more western front appears to have dominated the system, and the only area where there seems to be cyclonic circulation developing is that point way south of Tasmania. That conceivably might move up and affect New Zealand in a few, in a couple days, but right now I don't see how it could affect Australia.

CAPCOM Roger, Jack.

END OF TAPE

SC Go ahead, Bob.
CAPCOM I just wanted to give you fair warning, Jack. Save yourself a bump there when you're about ready to go to sleep there. It's 731745. You'll cross that magic line. It is a lunar sphere of influence.
SC What's the number, Bob?
CAPCOM 73:1745.
SC Bob, do you read us?
CAPCOM Rog, we read you on circuit. We're reading you, Jack. How me?
SC You reading Gene, not me.
CAPCOM Okay, sorry. I'm reading 17 loud and clear.
SC Okay, this is Geno. What was that number on the lunar sphere of influence?
CAPCOM 73 hours, 17 minutes, 45 seconds. 731745.
SC Okay, Bob. You're a little intermittent. Anyway, what you mean is we start hauling the mail I guess, huh?
CAPCOM Roger.
SC I guess we hit our slowest point. How fast are we going now?
CAPCOM Gene, you're pretty slow today. You're at 2354 feet per second.
SC Yeah. That's quite a drop from the 35 K that the SIVB put us on.
CAPCOM That's for sure.
SC Say, Bob. What do you hear from my home front? Anything?
CAPCOM Talked to Tracy a little while ago, and she's listening to the box quite often and enjoying it, and everybody's fine there.
SC Bob, you're continuing (garble). We're getting every third word.
CAPCOM Gene, do you read me any better on this one?
CAPCOM 17, Houston.
SC Go ahead, Bob.
CAPCOM How do you read me now?
SC I think you're still (garble) off.
CAPCOM Rog, you're breaking up on us, too. Let's check it through here, a minute.
SC Okay.

END OF TAPE

CAPCOM We were wondering who was going to be wearing the headset tonight, Jack. Whose got the duty?
CAPCOM 17, Houston.
SC Hey, Bob, are you reading us now?
CAPCOM 17, Houston, did you call?
SC Yeah, just wondered if you're reading us now, Bob.
CAPCOM Rog. Reading you now loud and clear. I was just off a minute there talking to Barbara on the phone. Everybody's fine on the home front, Gene.
SC Okay, what did you say Tracy said earlier?
CAPCOM She just said she is tickled pink and listening on the squawk box.
SC I guess that's the way a nine year old daughter should be in a case like this, huh?
CAPCOM That's affirmative.
SC In case she's not listening tell her not to forget to feed the horses.
CAPCOM Roger.
CAPCOM Barbara said I should find some nice young female voice around here to tell you she loves you, and good night, but I figure we'd better not do that.
SC Okay, enough said.
SC I guess what we don't need right now is a nice female voice.
CAPCOM I'm sure of that.
SC We're just happy, healthy, hungry and homesick.
CAPCOM Ron, you got a lot of work to do and you better not say you're hungry, the doctor about went through the overhead over here when you said that.
SC Ah, that's a cliché.
CAPCOM Roger.
SC Bob, just in general how is the spacecraft looking to you? Pretty good, I hope.
CAPCOM That's affirmative. We haven't found anything, I guess we're, stop getting those spurious master alarms here for a while so that was the only witch hunt we were having right there, was trying to find that.
SC Yeah, they disappeared. The ones we've had recently seem to be real ones.
CAPCOM Roger.
SC Hey, guys, we were just still trying to figure out who is going to wear the headset and who has the duty tonight?
SC I'll wear it tonight, Bob.
CAPCOM Is that Gene?

APOLLO 17 MISSION COMMENTARY 12.9/72 21:53 CST 73:00 GET MC290/2

SC Yeah.
CAPCOM Okay.
SC And Houston, 17. You ready
for some onboard readouts?
CAPCOM You better believe it.
SC Okay, Bat C, 36.8; Pyro Bat A, 37.0; and
Bravo is 37.0. RCS Alpha 93, 91, 91, and 94. Over.
CAPCOM Roger. Got 'em all Ron.
SC Houston, we're cycling the HZ fans now.
CAPCOM Roger, 17, go ahead.
SC Okay, we're cycling the H2 fans.
CAPCOM Okay, we copy.
PAO This is Apollo Control at 73 hours
18 minutes. Apollo 17 has just entered the lunar sphere
of influence and the distance velocity displayed here in the
Control Center are now referenced to the Moon, Apollo 17
is 33 803 nautical miles from the Moon, traveling at a speed
of 3355 feet per second.

END OF TAPE

PAO This is Apollo control at 73 hours 23 minutes. On it's present trajectory and without doing a lunar orbit insertion burn Apollo 17 would reach it closest approach to the Moon at a ground elapsed time of 88 hours 58 minutes 12 seconds. The distance of that closest approach would be 53.48 nautical miles and spacecraft velocity at that time would be 8 198 feet per second. We expect the crew to settle down into an 8 hour rest period here very shortly. On the flight plan that rest period due to begin at 73 hours some 24 minutes ago. We do expect that the crew will shortly go into that rest period.

SC Hello, Houston.
CAPCOM 17, Houston, go ahead.
SC Okay, Bob we're going to turn out the lights now and hit the sack.
CAPCOM Okay, have you gone through the presleep checklist getting ready on the comm and all that?
SC Yes, that's affirm. The presleep checklist. Am I what?
CAPCOM We're not getting any biomed data on - suppose to be on Ron I guess. (garble)
SC Houston, do you read 17?
CAPCOM 17, Houston, how do you read me?
SC Yes, I'm reading you Bob what did you say. Am I what?
CAPCOM Might check the sensors on Ron. We're not getting any biomed data. Is he unplugged?
SC Well that's because he's - yes, he's unplugged give him a chance to get hooked up and change some leads here.
CAPCOM Okay.
SC Everything else the presleep check, presleep checklist is complete. I'm going to leave the comm cap on tonight. Our tone boost doesn't work so I will just be on comm all night.
SC Do you have any biomed on, Ron?
CAPCOM Stand by on that, Gene.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/9/72 22:40 CST 73:47 GET MC292/1

SC Goodnight, Robert.

CAPCOM Goodnight, Gene.

CAPCOM Got a busy day tomorrow and we'll be
with you.

PAO This is Apollo Control at 73 hours
49 minutes. We said goodnight to the crew at 73 hours
and 47 minutes and we don't expect any more conversation
with them tonight. Flight Surgeon is now receiving good
biomedical data from the Command Module Pilot, Ron Evans.
We'll leave the line up for a few minutes in case there
are any postscripts to the air-ground and if not we'll take
the line down and come back up hourly with reports. But
for the moment we'll leave the line up live. This is
Apollo Control. As the crew turns in the spacecraft is
32 741 nautical miles from the Moon, velocity 3362 feet per
second.

PAO This is Apollo Control at 74 hours
4 minutes. Apollo 17 now 32 264 nautical miles from the
Moon, velocity 3366. The crew has settled down for the night
and we'll take the lines down now and come back up with hourly
reports.

END OF TAPE

PAO This is Apollo Control at 74 hours 50 minutes. Gene Kranz and the white team of flight controllers are preparing to take over duties in the Mission Control Center, relieving the orange team which has been directed tonight by Chuck Lewis. This has been a relatively quiet shift. A major activity was the medical experiment to gather more information on light flashes that most Apollo crews have seen with their eyes closed. We also updated the ground elapsed time clock during this shift, moving it ahead 2 hours and 40 minutes, this being necessary to bring the Greenwich mean time ground elapsed time in the flight plan into agreement. These areas had not agreed because of the late launch. The crew reported seeing the S-IVB in the distance at one time during the shift. The spacecraft entered the lunar sphere of influence at 73 hours 17 minutes 45 seconds, and we said goodnight to the crew at 73 hours 47 minutes. 6 hours 8 minutes remaining in this rest period now. There will be no change of shift news conference when the shift breaks at midnight - no change of shift news conference. In its present time, Apollo 17 is 30 705 nautical miles from the Moon, velocity 3 378 feet per second. At 74 hours 52 minutes this is Mission Control Houston.

END OF TAPE

PAO This is Apollo Control at 75 hours 37 minutes. Flight director Gene Kranz and the oncoming white team of flight controllers have been going over the status of the mission and find everything progressing very smoothly at this point. There are no anomalies in the performance of the spacecraft. All systems in very good shape and we're either up to or slightly ahead of the flight plan values on consumables at this point. During the shift a number of the flight controllers will begin working on some of the data the crew will use on awakening to place the spacecraft in lunar orbit, that event scheduled to occur at about 88 hours 56 minutes, and the retrofire officer and the flight dynamics officer will be busy during this shift working out some of the preliminary numbers that'll be used in the lunar orbit insertion maneuver. There is still no decision as to whether or not midcourse correction 4 will need to be performed and we suspect that that decision will also be made later on during this shift. At the present time Apollo 17 is 29 152 nautical miles from the Moon and the spacecraft velocity is now 3 391 feet per second. This is Apollo Control Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/10/72 01:30 CST 76:37 GET MC 295/1

PAO This is Apollo control at 76 hours 37 minutes. Now about 4 - 1/2 hours away from the scheduled crew awakening time, the flight surgeon reports that the crew appears to be resting comfortably at this time. Command Module Pilot Ron Evans is wearing the biomedical harness during this sleep period. And Commander Gene Cernan has the watch wearing the headset that would receive any call from the control center. Apollo 17 is 27 178 nautical miles from the Moon. And we're watching the velocity gradually build up under the growing affect of lunar gravity, up now to 3411 feet per second. This is Apollo control Houston standing by at 76 hours 38 minutes.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/10/72 0230 CST 7737 GET MC 296/1

PAO This is Apollo Control at 77 hours 37 minutes, continuing to maintain the watch while the crew aboard Apollo 17 gets some sleep - Now about 3 1/2 hours left in that sleep period and that could be extended by 30 minutes or so if a decision is made not to make the final midcourse correction before going into lunar orbit. We expect to be getting a reading on the necessity for that midcourse correction which in any event will be a very small maneuver, before this shift ends. The midcourse correction opportunity occurs at 83 hours 55 minutes in the flight plan and the Flight Dynamics officer has gotten what appears to be a good final indication of the impact coordinates for the Saturn third stage. The latest coordinates are 4 degrees 11 minutes south and 12 degrees and 23 minutes west. Apollo 17 at this time - 25 131 nautical miles from the Moon. The spacecraft velocity 3434 feet per second. This is Apollo Control at 77 hours 38 minutes

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/10/72 CST 03:30 GET 78:37 MC 297/1

PAO This is Apollo Control at 78 hours 37 minutes. There's been no change in the spacecraft status during the past hour. Everything continues to function normally and we have about two and one half hours remaining in the crew's sleep period. The flight dynamics officer reports that we've got a midcourse correction if it's performed prior to Lunar Orbit Insertion of about one half foot per second or less and that very small maneuver, if performed, would occur at 83 hours 55 minutes. Apollo 17 is now 23 112 nautical miles from the Moon and the spacecraft velocity up to 3 460 feet per second. We'll see that increase to somewhat in excess of 80 000 feet per second as the spacecraft reaches the Moon and swings around the Moon goes into orbit. The Lunar Orbit Insertion Burn removes on the order of 3 000 feet per second from that velocity. A lunar orbital velocity of about 1 mile per second. The flight surgeon has noted some stirrings of a bit of an elevation in the heart rate of Ron Evans, who is wearing the bio-medical sensors during this sleep period, although for the most part Evans has been sleeping soundly. At 78 hours 39 minutes, this Apollo Control, Houston.

END OF TAPE

PAO This is Apollo control at 79 hours 37 minutes. Now about an hour and $\frac{1}{2}$ away from the scheduled time for crew awakening. And it has again been very uneventful, very quiet sleep shift. With the flight controllers here in mission control monitoring spacecraft systems. Everything continuing to perform almost perfectly as planned; everything nominal. And our flight dynamics display at the present time is showing the spacecraft distance related to Earth, Apollo 17 now 198 800 nautical miles from Earth, traveling at a speed again with respect to Earth of 2168 feet per second. After awakening the crew's major activities during the day include jettisoning the scientific instrument module door which exposes the scientific instruments in the spacecraft's service module to the lunar environment. Lunar orbit insertion is scheduled to occur at about 88 hours 56 minutes. The Saturn third stage will be impacting the lunar surface. And there's still a possibility of a final midcourse correction prior to lunar orbit insertion. That midcourse correction to occur - if it occurs at 83 hours 55 minutes. And we expect that we will have a decision or recommendation from the flight dynamics officer within the next couple of hours as to whether or not that midcourse correction will be required. If it is done, it will be a very small maneuver performed with the reaction control system thrusters on the CSM. At 79 hours 39 minutes this is Apollo control Houston.

END OF TAPE

This is Apollo Control at 80 hours 41 minutes. We have about 18 minutes remaining before the scheduled crew awakening time, however, we're planning to give them at least an additional 15 minutes of sleep and perhaps 30 minutes additional. The Flight Dynamics officer hopes to delay a decision on the need for midcourse correction 4 until additional tracking data is available. That maneuver, if its performed, remains very small - on the order of a half foot per second. And the decision revolves around what height of approach pericyynthion we'll have with or without the maneuver. Tracking data right now shows that Apollo 17 will be approaching the Moon with a pericynthion of about 52 nautical miles - the desired pericynthion is 53 1/2. And the FIDO would like to get a bit more tracking data before making that decision. So we'll be putting off the decision as to whether or not to awaken the crew or give them more sleep time until the last possible moment. Apollo 17 at this time is 18 839 nautical miles from the Moon and the velocity up to 3500 feet per second. We've seen no signs of activity aboard the spacecraft. The Flight Surgeon will begin to note increased heart and respiration rates on Ron Evans, who is wearing the bio-medical sensors during the sleep period and before receiving a call from the crew we'll see the voice sub-carrier come on and we'll be watching for any of those cues. If it appears that the crew is indeed up and about we'll bring the lines up and standby live or as soon as the decision is made to send them a wake-up call we'll come up and standby live. At 80 hours 44 minutes this is Apollo Control.

END OF TAPE

PAO This is Apollo Control at 81 hours 25 minutes. We are planning to put a call through to the crew in about 5 minutes to awaken them and Apollo 17, at this time, is about 17 350 nautical miles from the Moon. Spacecraft velocity is about 3567 feet per second. After awakening the crew we will be discussing a minor problem that has been noted during the sleep period. This involves a heater cycling in one of the three cryogenic hydrogen tanks that supplies hydrogen to the fuel cells. The nature of the problem is a heater that is cycling more often than normal. These heaters are controlled by a pressure-sensitive switch on the tank as the temperature within the tank drops and the pressure drops. The switch senses this and activates the heater to bring up the temperature and hence the pressure within the tank and ensure a constant flow of hydrogen to the fuel cells. The sensor appears to be responding to a much narrower range of temperature decrease that would normally respond to about a 20 degree excursion in temperature and it is now apparently responding to about a 2 to 3 degree temperature excursion, and therefore cycling more rapidly than would normally be the case. This in itself is of no concern, however if the automatic cycling should fail, if the automatic cycling function should fail, it would require going to a backup manual mode whereby the crew would be instructed to turn the heaters on and off at certain intervals to maintain the proper pressure in the tank, which, by the way, is a mode of operation that has been used on previous missions, and works very well with a minimum impact to the crew time. And, as mentioned at this point we would see no reason for having to go to a manual mode. That would require some subsequent failure. This situation, however, will be discussed with the crew and they'll be advised as to the procedure that would be taken in the event that subsequent failure should occur necessitating the manual activation of the heater within this one tank. And we are now about 1 minute 50 seconds away from the scheduled awakening time, having given the crew an additional 30 minutes of sleep. The flight dynamics officer expects to give us a GO or NO/GO for the midcourse correction prior to lunar orbit insertion in about a half an hour at some 82 hours ground elapsed time. We'll continue to stand by live for that call to the crew.

END OF TAPE

CAPCOM Apollo 17, Houston, did you call?
SC Good morning Houston, anybody there?
CAPCOM Okay, good morning, it's LOI day,
Apollo 17.
SC Hello, Robert, you gave us an extra
half hour.
CAPCOM That's affirmative. We're presently
still debating on midcourse 4, Geno, and at the present
time it's small, about a half a foot per second, we're
expecting a final decision on whether it's necessary or
not in approximately 1 hour at 82:30. We'll let you
know then, but it will be small and so we decided to
give you an extra half hour of sleep.
SC Okay, Bob, without me having to
look it up when will it come if it comes.
CAPCOM Standby. 83:55, so we'll give you
about an hour and 25 minutes advance notice.
SC Okay. Well, we'll start stirring
around.
CAPCOM Okay, give me a call when you want
to talk to people.
SC Hello, Houston.
CAPCOM Hello there, 17, good morning.
SC I'm not sure we're ready to talk yet,
Bob, but I just thought you'd like to know we got a pretty
spectacular view of Africa today. We can see the Sinai,
can see the Red Sea, the Sea of Aden and for the first time
I think we cannot only see the Mediterranean, but we can see
the most of the Southern European countries, Turkey and
Greece and up in Italy and some of those places, can't
quite see Spain because you're just about on the horizon
and for the most part, it looks like the weather throughout the
Mediterranean and Northern Africa looks pretty good.
CAPCOM Okay, we're copying that. And if you
guys are willing to do a little switch flipping this early in
the morning, we'd like you to turn on the pan camera heaters,
which means if somebody's down there in that vicinity it's
SMAC power ON and the self test switch to heaters. Over.
SC You want the SMAC power ON and the
self test switch to heaters.
CAPCOM That's affirm.
SC Okay, we'll get that.
CAPCOM Okay.
SC Okay, we got both of those.
CAPCOM Gee, I didn't wake you up, did I?
SC Well -

END OF TAPE

SC Okay, Bob. The LM/CM Delta P is .6.
CAPCOM Okay, copy that. Sounds good.
SC Hello, Houston, Apollo 17. How do you read?
CAPCOM Hello. Loud and clear, 17. We're with you.
SC Okay, we didn't get you there for about 5 minutes,
Bob, but good uplink signal strength. We're you guys having a
problem?
CAPCOM No, not that I know of. We were getting a lot
of noise down here and we seem to think that you guys were prob -
assumed you guys were turned away from us or something, but we're
with you.
SC No you might think about that one a little bit.
We had a very strong uplink - signal strength as good as right now.
Gene was trying to call you off and on for several minutes and we
didn't get any response. Sounds real good now.
CAPCOM Okay, sorry about that.
SC Hey, Bob. Good morning. It's a good chance to
talk to you for once.
CAPCOM Yeah, for once, yeah. Talk to you now this next
hour and I won't talk to you again for another 3 or 4 days, Ronald.
SC (laughter) Okay.
CAPCOM Nice to be able to talk to somebody for a change -
SC Bob, your friendly medical officer -
CAPCOM Go ahead.
SC Go ahead if you've got something to say.
CAPCOM (Garbled)
SC Okay. Your friendly medical officer has all the
good words starting from the CDR and the food. Are you ready to copy?
CAPCOM Ready to copy.
SC Okay. It was a big day yesterday eating-wise.
CDR had sausage patties, pears and cocoa for breakfast. Ham,
a quarter, 1-quart cheese-spread. 1/2 bread and 1/2 cereal bar, 1 orange
beverage for lunch, tomato soup, half a hamburger, half mustard,
vanilla pudding and an orange pineapple drink for dinner.
CAPCOM Okay, copy that.
SC Five hours of good sleep, and two more containers
of water.
CAPCOM Okay, 17, I got the CDR's food and then you broke
up and I got 5 hours of sleep and two containers of water. Was
there something between?
SC That's affirm, your PRD reading 17032.
CAPCOM Okay, copy that.
SC And I think, Bob, we're coming around different
OMNI so I'll wait on the rest of it.
CAPCOM Roger. That's affirm.

END OF TAPE

SC Okay Houston, 17, how do you read now?
CAPCOM Okay read you again, go ahead.
SC Okay for the LMP the food eaten - well let's see, I guess its a toss-up eaten vs. not eaten. I'll give you what I ate, sausage patties, grits, pears, pineapple-grapefruit drink, coffee and let me make a note that the package of peaches in that pack was broken in the package. Also, I had chicken soup, ham, bread, orange drink and 4 bacon squares. For dinner I sort of ate some left overs and grape drink, corn chowder, chocolate pudding. And I had - stand by. The PRD reading: 24080, and 7 1/2 hours of very good sleep last night. I took a secondal in order to get to sleep and I've had 1 and 1 or 2 and 1/2 containers of water since last report.
CAPCOM Okay copy all that, Jack.
SC Okay, the CMP. The chow hound of the kennel here had: sausage, grits, fruit cocktail orange beverage and coffee. He had ham, cheese bread, peaches, cereal bar and orange-pineapple drink. Later on he had tomato soup, half of a hamburger, half mustard, vanilla pudding, sugar cookies, grape drink and tea. And he has a complaint this morning much like mine that his apricot package had broken in the bag, and although not too severe itself, it makes everything else pretty sticky.
CAPCOM I copy that.
SC Okay, CMP medical is 15031 PRD, he had 7 hours restless sleep and he'd like a few comments from the doctors on how that looked on his biomed and he had a Secondal and he had 4 containers of water.
CAPCOM Okay, we copy all that one also, Jack, you guys still gonna fit in your space suits?
SC If you'd stick around, we tried those on yesterday.
CAPCOM Roger copy, tried to talk to you guys yesterday morning but I didn't quite make it, there was a problem apparently some place.
SC That's all right, we're stuffing him with food so he can't sleep.
CAPCOM Okay and the comment concerning Ron's sleep from the surgeon, Jack is that he was restless the first hour and had periods of restlessness during the night but we logged him for about 7 hours of sleep also. But we did see periods of wakefulness, some of which were up to 10 minutes long.
SC That sounds about right, that's good, thank you. If I can't tell how long I'm awake and you know, how long you were really a sleep.
CAPCOM I'll tell you, Ron, you wake up during the night you might sit there and stare at the second hand and then count how long you're awake.
SC (Laughter) okay.
CAPCOM Okay, we owe you guys a consumable update. And on RCS consumables you're RCS fuel remaining is still 1.4 percent above the Flight Plan, that's a slight improvement over the 1.3 percent from yesterday.

SC I guess everything else is about like yesterday, is that right, Bob?

CAPCOM Roger, consumables are still about the same. If you guys will wind your watches we'll consider the post-sleep checklist finished.

SC Okay and Geno has got his no bias check for you.

CAPCOM Okay, roger on that, we're waiting.

SC Okay, Bob, made 2 checks over a period of 100 seconds. One was minus 99.0 and the other was minus 98.9.

CAPCOM Okay we copy minus 99.0 and minus 98.9, Geno.

SC And -

CAPCOM And we'd like omni Charlie, please there, 17.

CAPCOM And Apollo 17, Houston, we'd like to recommend you go squelch off at this time if you haven't and we'll keep calling the omni as it changes you're to rotate, over.

SC Bob, we've been flying normally with it in able, maybe you think that's the problem?

CAPCOM Stand by a minute and while we're thinking about, can we confirm that the only medication you've had is a Seconal for you and a Seconal for Ron, and nothing for the commander?

SC This is Geno, that's right, I did not take any Seconal, last night. One thing I wanted to talk to you about though, I took one anti-gas pill after breakfast, I took one after supper and I took one prior to going to sleep which were probably within an hour apart. If you've got a better solution than those gas pills, I'd sure like to hear it.

CAPCOM Understand that Gene, we'll get back with you on that later.

CAPCOM And, Jack, as far as turning the squelch off, they do believe that we're better with that for margins in general managment than this distance with the omni. As soon as we plot a PTC and go on the high-gain we'll be much better off.

SC Okay, Bob.

END OF TAPE

CAPCOM And, 17, Houston. You can do without your water
dump now. We're in good shape. We'll dump at 94 hours.
SC 94 hours. Okay.
SC Bob, does that mean we can go ahead with the
urine dump on schedule?
CAPCOM Say again there, Geno, on the urine dump.
CAPCOM Say again, Geno, on the urine dump.
SC Rog. Can we press on with it on schedule?
CAPCOM That's affirmative, sir. It's just that we don't
need to do the water dump, that's all.
SC Oh.
SC Okay, fine.
SC Okay, that was 7230.
CAPCOM Okay. Copy that. And part of the reason we
had a little problem that this last time, Jack, was we planned
to call the OMNI's and we didn't get the word around down here. And
we didn't call the OMNI to you in time. We're still planning on
doing that, and I think we'll be more coordinated next time.
SC Okay. We'll bear with you.
CAPCOM And Jack, I presume that's magazine November,
November.
SC That's affirm, Bob.

END OF TAPE

CAPCOM Omni, Charlie, 17 please.

SC Got it.

CAPCOM And Apollo 17, Houston, for your information we are scrubbing midcourse 4 and you can stay in PTC until 83:30 which will be about when you start to get ready for LOI anyway. We'll give you a call on that.

PAO This is Apollo Control. Apollo 17 now 14 thousand 948 nautical miles from the Moon and CAPCOM, Bob Parker, just advising the crew that we will not require a midcourse correction prior to lunar orbit insertion. The flight dynamics officer had been reviewing tracking data and establishing another vector, as he calls it, on the trajectory based on that last vector and it appeared that a midcourse correction of something less than a half of foot per second would be required, if performed. And flight director, Gene Kranz, made the decision to cancel the midcourse correction prior to lunar orbit insertion.

SC We're about three quarters of the way through eating. You got some news for us?

CAPCOM Stand by, I'll see. Did you catch the midcourse 4 scrub?

SC Yes sir. Apparently, you're not getting some of our acknowledgements.

CAPCOM Okay, must be. Captain Young, here, wants to tell you that it's raining outside and the paper boy apparently hasn't come in yet. Omni Delta, please.

SC I'm surprised he didn't get his paper delivered before he came in.

CAPCOM Roger. I suppose I should apologize to all the paper boys after saying that. But the news is still being put together for you guys. And standby. And Geno, some advice to you on the gas pills. I guess - suggestion down here from the surgeon is that one thing we ought to be sure to do is to chew the pills thoroughly. And apparently it helps in their effectiveness quite a bit and Dr. Young, beside me, also suggested if you're chewing chewing gum you might cut down on that a bit because he thinks this might be causing some gas.

SC Thank you.

SC I might add that both of those alternatives have been worked on.

CAPCOM We thought probably so.

SC Bob, although that we're getting close to concentrating our attention on the Moon, it doesn't decrease the interest in looking back at the patterns of activity we can see on the Earth. That storm -

END OF TAPE

SC Spatters of activity we can see on the earth. That storm I talked about yesterday, that was in North Africa, looks like it has left that area and has moved in - maybe, if it's there at all, it's just over the Iberian Peninsula, and maybe Gibraltar and that area is getting a little activity today.

CAPCOM Okay, copyright that.

SC It does not look very well organized, but - it's not very well organized right now, but - it's right out on the LM and it's hard to get a good view of it.

CAPCOM Okay.

SC The storm I guessed yesterday, I thought might be moving into the Cape of Good Hope, looks like it's dissipating and also staying south of that area. The whole of Africa is essentially clear except in the southern part of the inter-tropical convergence area where there's scattered patches of fairly dense clouds, probably getting scattered rain showers of some kind in there this morning. Some of those extend farther south than I've - we've seen them - down into South Africa. There's a - on one of the earlier REV's, when I looked out of the terminators, it looked like there was a depression developing about 30 degrees longitude east of Madagascar in the middle of the Indian ocean. A little bit northeast of Madagascar there's also a new area of clouds developed that looks like it's getting organized into a cyclo pattern.

CAPCOM Roger. Turn OMNI alpha, please.

SC Okay, you got it?

CAPCOM Thank you.

CAPCOM Okay, and Jack, while you guys are finishing your lunch - your breakfast there, excuse me. Are you all on your headsets?

SC Yes sir.

CAPCOM Okay, let me brief you on a little funny that we saw last night, and I'll start the briefing by mentioning that at the present time, it is not a great concern, but just to keep you up to date with what's going on, let me mention it to you. About 70 hours, which was probably about the time of your last exercise period, we saw 3 funnies with the hydrogen tanks, as I say, none of which is causing any great concern. The first of these was a shift to the limits of the pressure switch, the ones that turns the heaters on and off, remember there are two of those switches, one on tank 1 and one on tank 2 and they work in series, and one of those switches, we can't tell which, but we suspect it's probably tank 2 because of the other funnies, I'll get to in a minute in tank 2. One of those switches went from a 13 psi range, in other words a plus or minus 6.5 psi range. It changed its range down to plus or minus 1.5 psi so its now

CAPCOM total range is only 3 psi. The main result of that is that it means that the pressure switches and the motor switch turning the heater on, acts more frequently or a shorter period of time. The second thing which we observed following this, and we're not at all sure if there is any correlation between this and the others. We observed a high frequency pressure oscillation in tank 2. It was about a 5 psi peak to peak oscillation, a frequency of about 2 cycles per second. And this lasted for about 3 to 5 minutes. A third funny that we observed, this was in tank 2. The third funny that we observed was an erratic, and possibly correlated with the high frequency oscillation, but an erratic total fuel cell occurrence, and here again we were looking at oh, peak to peak variations of something like 5 amps or of 5 to 10 amps. And the suspicion is that coupled with the shift in the limits of the pressure switch, some acoustic vibrations were set up in that tank, and we may have seen them causing the oscillation of the motor switch, which was then reflected in the fuel cell currents. Again these erratic, and possibly correlated fuel cell currents lasted for about 3 to 5 minutes. And since then, all during the night, there've been no further events of this sort and the pressure switch with its reduced limits has been acting quite normally, just with the reduced limits overnight. As I say again, we're looking at it, people are studying it in great detail, with no real answer at the moment, but there is no great concern at the present. And it appears that the worst that can happen is for the motor switch to stall because of over use. And if this would happen, it would force us to go to manual management of the heaters on the H2 tank. That appears to be the worst, at the moment, that we can anticipate from this group of funnies. Over.

SC Okay, Bob. Understand that. You know, I wonder if we ought to stop stirring the cryos the way we've been doing it.

CAPCOM That has been suggested, but again, it's not very clear that any of these things are terribly correlated.

SC Okay, also, you know, if you want to reduce the activity on that switch, depending on how much you need to have it done during quiet periods such as eat period and things like that, we could go to manual operation.

CAPCOM Negative, Jack, because the switch -
OMNI bravo, please, 17.

SC Okay.

CAPCOM If you pull out your schematics there, you'll find that no matter what you do, the - you can turn the thing off, in fact, and the switch will continue to operate the motor switch, the pressure switch will continue to operate the motor switch off the service module busses. There's

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CAPCOM Nothing you can do. The only thing you'll do if you go from AUTO to MANUAL or OFF is you'll keep the currents from going to the heaters, but the motor switch will still operate.

SC Okay. Thank you for the education.

CAPCOM And I've been corrected, the frequency of the pressure oscillation was more in the vicinity of a cycle every 4 or 5 seconds.

SC Okay.

CAPCOM And 7 -

SC Let me ask a couple questions.

CAPCOM Go ahead.

END OF TAPE

SC Make sure I understand this. You're not sure whether the heater cycling and the pressure cycling were correlated, is that correct?

CAPCOM That's affirmative.

SC In a cycle every four or five seconds, is it possible for the heaters to effect the tank that fast?

CAPCOM That's not possible, so the only thing really - we think could - the tank is too much of a heat sink to do it that way. What may have happened was that if you set up an oscillation, a mechanical oscillation in the tank to one way or another, that this could then have active back-up on the motor. But the motor switch in driving the heaters could not have reinforced the oscillation because the tank is too much of a heat-sink.

SC Okay. When did you say this happened with respect to our exercise period?

CAPCOM That's not well pinned down 17. We do know it hasn't occurred since about 71 hours and it did occur at approximately 70 hours which was about the time of your exercise period. But, we haven't been able to correlate that exactly with the start or the finish of the exercise period.

SC Well you know you should be able to do that because of the biomed on the - at least on me and Ron's was on too. But, as soon as I started exercising he you should have the BIO MED data on my heart-rate. It was unscheduled exercise period, we just went into it before eat period, I think. Let me check back.

CAPCOM Okay. And, we can check back and time you more specific on what the times were there in terms of your exercise period also. I'd like OMNI Charlie, please, there 17. And we might mention that oscillations like had been seen on the ground under somewhat different circumstances, but oscillations like this have been seen on the ground in ground tests previously. And I might say, also, that as far as other things in the spacecraft are current everything looks absolutely normal, nominal, as the case may be in great shape and I might emphasize again, that we've seen none of this oscillation again since 71 hours. Over.

SC Okay. Bob. That was, as you say, pretty close to the exercise. I can't pin it down in the checklist exactly but it was somewhere after ALFMED was complete. And before we changed that canister, I think we changed that canister a little early. About 70:50. So I think the manning should have pretty good data on when we were exercising. And the reason I say that, because the way we were, I was exercising anyway, I'm sort of running in place against the LEB and conceivably could have gotten oscillation going in the tank.

CAPCOM Roger. Understand that.

CAPCOM OMNI DELTA, 17.

CAPCOM And 17, we did a little investigation of times

CAPCOM down here. We found that at 71:12 you were exercising at 130 beats per minute there, Jack. And we think the exercise period ended about 10 minutes later on 71:22. The H2 tank funny started about 71:37 with the pressure switch shift and 71:42 with the oscillations. Over.

CAPCOM So then it would be 15 minutes after the exercise period was over.

SC Okay. I just wanted to clear my reputation, Bob.

SC Now, it's perfectly clean again.

CAPCOM As clean as ever anyway.

CAPCOM Okay. 17 I guess we decided to let - we'll run the OMNIs down here instead of having you guys push them all the time. So if you'll select OMNI BRAVO at the present time, then we'll take over and run these OMNIs for you.

SC Okay Bob. It's not too big a deal. If any-time you think you want to talk to us continuously go ahead and call them, if we're not busy.

CAPCOM Okay. Copy that. Let us know when you're ready. I've got a pad here for you guys to copy, but there's no big hurry on it. Finish your eat period and give us a call.

SC Okay. I'll be with you in about 5 minutes.

CAPCOM Say again there, 17.

SC Be right with you, Bob.

CAPCOM All right.

SC And looking at the Flight Plan, we're going to go ahead and change the canister and we've got the H2 pressure line heaters on. We're going to configure for the urine dump. We'll go ahead and do our stop our PTC at 83:30 and then we'll do our P52.

CAPCOM Roger. Copy that.

END OF TAPE

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CAPCOM And 17, that P52 at 83:10 was primarily intended for the MCC-4. There's some more following anyway before LOI so we suggest you scrub the P52 at 83:10.

SC Okay, fine. I may just do a little OJT without torquing.

CAPCOM That's your business.

PAO This is Apollo control at 82 hours 57 minutes. We're completing a shift handover at this time in Mission Control. The team of flight controllers headed by flight director, Gerry Griffin, coming on now to replace the Gene Kranz team. The spacecraft communicator on the upcoming shift is Astronaut Gordon Fullerton. We do not plan to have a change of shift press briefing at this shift change.

SC Bob, when we come out of PTC, then you want us to go right to the SIM door jett attitude.

CAPCOM That's affirmative, 17.

SC Okay, and you want us to do that about 80 - 83:30.

CAPCOM Roger. That's affirm.

SC Okay. Bob, what pad are you going to give me?

CAPCOM Okay, I've got a - coming up pericynthion plus 2 hour abort pad here.

CAPCOM 17, Houston.

SC Yeah Bob, here's 17. Say, for awhile here, why don't you guys go ahead and manage the OMNI's I think we can get things done a little better and when it becomes inconvenient for us to switch we'll let you know.

CAPCOM Okay. You want us to call 'em to you - is that what you're saying by we managing the omni?

SC Yeah, we lose 5 or 10 minutes going around here without COMM and it usually breaks up seemingly when somebody has something to say, either you or us.

CAPCOM Roger. Okay. That's fine. Stand by.

SC That's up to you guys but seems to me it would be more convenient.

CAPCOM Okay, things are good now, Jack. Do you want to copy this pericynthion plus 2 pad at the present time.

SC Yeah, I'm just about ready, Bob.

CAPCOM Okay, give me a call when you get it.

CAPCOM And while you're getting ready there you might think back to yesterday afternoon just after the exercise period and the question that's raised is whether you were running the DAC or some other miscellaneous equipment at that time which might have caused some high current usage?

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CAPCOM Or erratic current usage?
SC We'll think about that, Bob, but
offhand none of us can remember doing anything like that.
CAPCOM Okay, copy that.
CAPCOM Omni, Charlie, 17.

END OF TAPE

CAPCOM And 17, your peaceful night shift capcom is signing off, I'll talk to you on the surface, tomorrow, good luck.

SC Thank you, Robert, looking forward to seeing you there.

SC Are you leaving us, Bob?

CAPCOM That's affirm, he's already left.

SC Boy, he doesn't stick around long, does he?

And he wanted to read that PAD to me, well that's too bad. Okay Gordy, I can take the pad now.

CAPCOM Okay, Jack. It's pericyynthion plus 2 SPS/G&N. Weight is 66 373 plus 118 minus 014, ignition time is 090:49:55:82, plus 17875 minus 18917, minus 23968, attitude is 237 126 332, and all the rest of the PAD is NA, GDC align stars are Sirius and Rigel 122 354 000. Ullage is none. Remarks: number 1, burn dot, number 2 assumes LOI REFSMMAT, over.

SC Okay, pericyynthion plus 2 SPS/G&N 66 373, plus 118 minus 014, 090:49:55:82, plus 17875, minus 18917, minus 23968, 237 126 332, rest of PAD is NA; Sirius and Rigel 122 354 000. No ullage. Remark 1, burn dot 2 is LOI REFSMMAT assumed.

CAPCOM That's correct.

CAPCOM Need omni Delta, now.

SC Houston 17, canister change complete.

CAPCOM Okay.

CAPCOM Roger, switch to OMNI Alpha.

END OF TAPE

CAPCOM America, Houston, I have the morning news at the convenient time.

SC Fire away, Gordo.

CAPCOM Okay, first of all the weather. It's raining fairly - fairly heavily all night, there's a lot of water standing around. Temperatures here are in the high 50's, but it's supposed to get a little cooler tonight with a low in the 40's. I think you know how the Dallas-Redskin game came out, only thing additional mentioned here is that chances look good now that Washington and Dallas may meet in the rubber games where the National Conference representative in the Super Bowl. In the other pro game yesterday, a field goal by Don Cockroft was the difference in a 26 to 24 win by Cleveland over rival Cincinnati. Other sports highlights, the Pittsburgh Steelers play the Oilers today in the Dome, other big games will be Atlanta at San Francisco, Green Bay at Minnesota, and Baltimore at Kansas City. Tennessee State beat Drake University in the Pioneer Bowl 29 to 7. And East Texas State Carson-Neuman in the NAIA football playoffs. The Southwest Conference has pulled out of the U.S. Olympic Committee. Some college basketball scores: The Houston Cougars routed Xavier last night out at Hoffheinz Pavillon 114 to 73 and Rice downed George Washington 93 to 89. Gene, you'll be glad to hear Purdue ripped TCU 101 to 70 and it was Texas over Oklahoma State 86 to 66 and SMU over Oklahoma City 106 to 83. We couldn't find any score on Cal Tech, Jack, but switch to omni Bravo, please. But one final score, Ron, Kansas lost to Iowa 69 to 56. The only thing new on the plane crash Friday in Chicago it's reported here that the plane apparently waved off because another plane was still on the assigned runway. The Democratic Party's stormy session in Washington saw the old guard Democrats apparently take back control of the Party from pro McGovern forces. Mrs. Jean Westwood was replaced as party chairman by Texas lawyer/business man Robert Strauss. Former president Truman appears to be more than holding his own at a hospital in Kansas City. There's a good chance the 88 year former chief executive may be taken off the critical list. There's been a one day interruption in the secret peace talks between Dr. Henry Kissinger and Le Duc Tho. The two conferred for over 3 hours yesterday. Both sides have agreed not to talk to news men on any substantive matters. In other news highlights, President Nixon has named Daniel Moynihan as U.S. Ambassador to India. And Chilean President Allende has flown to Cuba to visit Fidel Castro. Here's an interesting one, a 45 year old pilot lost in the Arctic for 31 days has been found alive and well. Three companions were killed. And Soviet party boss Leonoid Breshnev has delayed a scheduled visit to the U.S. It looks as if the visit may come in the fall rather than this coming Spring. One last note: The news media says the flight of Apollo 17 is the smoothest on record so far, and I call that last one pretty accurate reporting, over.

SC Thank you Gordo, appreciate the news. Sounds like things are still happening down there.

CAPCOM Got some more parochial news here -

SC

Houston we are starting our -

CAPCOM

Go ahead.

SC

I just wanted to tell you we're starting our

waste dumps.

CAPCOM

Okay. A little more parochial news. I have your oxygen consumable status here. Tank 1 is still running 4 percent below the line; the other two are right on the line, really no news here. Same with the hydrogen, all 3 are essentially right on the preflight line over.

SC

Okay, that's the way like to hear it.

SC

We'll bring all that home if we can.

CAPCOM

Okay.

CAPCOM

We'd like OMNI Charlie please.

END OF TAPE

CAPCOM Need OMNI DELTA now.
SC Okay, Gordie. How would you like a hydrogen purge this morning?
CAPCOM Better make sure.
SC Go ahead Houston, 17.
CAPCOM 17, we do want the hydrogen purge, go ahead.
SC Okay, hydrogen purge is in process. You'd never believe it, dust collection container assembly serial number 5725 has developed a hole in it. Fortunately, with a lot of dexterity, I was able to put a piece of tape in the hole.
CAPCOM Okay, I guess that's why we sent men into space.
SC (laughter) Right.
SC Gordie, while the purges are going on here, I might mention, a little while ago I looked at the earth through a polaroid colored glass again, and had a full view of Africa, and it appeared of the red and yellow portions of Africa, that the land area darkened considerably more than those areas that are green or foliated, and that would be the central portion. That is, they darkened with the handle on the lens going in a north-south rather than east-west.
CAPCOM Roger.
SC The land areas though, still do not show as marked a contrast as do the oceans.
CAPCOM Roger.

END OF TAPE

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CAPCOM Omni Alpha.
SC Okay, hydrogen purge is complete. Heater is going OFF.

CAPCOM Rog.
SC Gordy, it looks like the cloudiness and possibly the showers associated with the intertropical conversions over Africa are moving as far south as Johannesburg right now. It's quite a distinct change from even an hour or so ago - a couple of hours ago. They're down into an area where, presumably they're not normally found and vegetation indications are any criteria. And also in the Atlantic - South Atlantic near Goa Island there seems to be a possible storm developing as part of what was probably now a fairly weak front. And whether or not that will develop into anything and move in towards Capetown is hard to say at this time.

CAPCOM Rog, Jack.
SC It looks as if our old friend at Ascension are enjoying a fairly nice day out there.

CAPCOM Roger.
CAPCOM Omni Delta, please.
CAPCOM Jack, this is Houston. We recall you mentioning the purge complete and the heaters off. We just wanted to be sure that you did leave the H2 purge line heaters on for 10 minutes after terminating the purge. Over.
SC Thank you, Gordy. I'll turn them back on.

CAPCOM Okay.
SC Who's sitting over there reminding me of all these good things this morning?

SC Well, that was a combination effort by John Arron and Charlie Dumis.

SC Wow, you've got a real powerful team there.

CAPCOM You bet.
SC Hey, you really ought to get them a cup of coffee though sometime this morning.

SC Gordy, also curious who's watching Challenger this morning?

CAPCOM Well, let's see.

SC Not much to see, I realize, but i'm sure somebody's there.

CAPCOM We need omni Charlie, Jack.

CAPCOM Well we've got the first team on - the gold team - your LOI and landing team and the LM guys are Merritt and Thorson.

SC You cut out on the LM, who - who is
it?
CAPCOM Merlin.
CAPCOM Merlin, the Magician.
SC I'm sorry Gordy, you clipped off the
first again.
CAPCOM Merlin Merritt, the magician.
SC Oh yes, of course. As I recall he's
the only one that really understands Thorson.
CAPCOM He says he doesn't think anybody under-
stands Thorson.
SC Well, we're sure looking forward to
having a chance to make those guys work a little bit.
CAPCOM They say - well - Merlin says he is too.
I don't know about Thorson. He's out of the room at the
moment.
SC He probably spilling coffee in SPAN.
CAPCOM Rog.
CAPCOM We need omoni Delta now.
SC Gordy, for some reason it's a lot easier
to tell the difference between the Antarctic continent and the
ice packs.
CAPCOM Roger.
SC Maybe the glossy sun is picking up the
breaks in the ice pack and giving it a different appearance.
CAPCOM Rog.

END OF TAPE

SC The continent itself, all you can see are very - what appear to be very gentle differences, or subtle differences in shading, possibly indicating rolling relief due to a photometric dark beam along the - as a function of opal phase angle.

CAPCOM Copy.

SC And except maybe for the area just - oh, I don't know, even there it's hard to - it looks like the whole visible continent is clear of clouds this morning. Possibly some clouds just east of the Ross Sea, which is just coming into view I think.

CAPCOM Roger.

SC I know we don't have many listeners in Antarctica, but it looks like they're having a exceptionally fine day over the portion of the continent we can see.

CAPCOM Roger.

SC That weak front I mentioned in the south Atlantic stretches from the apparent storm center around Goa Island - I'm not sure about that pronunciation either up just through the coast of South America from Brazil, where it reaches its maximum eastward extent.

CAPCOM Roger.

SC Our sub - our zero phase point of the spacecraft is in the middle of the South Atlantic. And it's moderately bright. Although, there is no central bright point at all - a fairly large area, but moderately bright. The sea down there might be moderately choppy or rough this morning.

CAPCOM Okay.

SC Houston, 17.

CAPCOM Go.

SC Okay, Gordie. you might say uh before you start your sentences cause you're clipping your first word. The question I had was the pan camera - we're on 1-6 of the experiments checklist and need your word on whether you want the pan camera off at this time, self test off.

CAPCOM Stand by.

CAPCOM We'd like to leave it in heaters.

SC Okay, we're leaving it in heaters.

SC Okay, Houston. The S-band AUX TV is going to science and I turned the IR on.

CAPCOM Okay.

CAPCOM Jack, we'd like OMNI ALPHA.

SC How do you read on OMNI ALPHA?

CAPCOM Okay, you're readable, fair amount of noise.

SC Hello, Houston. How do you read?

CAPCOM Jack, this is Houston. You're clear with considerable noise. Over.

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SC Houston, how do you read 17?
CAPCOM Apollo 17, Houston. Still reading you
with a lot of background noise. Over.
SC Hello Houston, how do you read?
CAPCOM 17, Houston. We're still readable.
SC Okay, we'll have you up on that high gain
pretty soon. I'm turning the IR ON.
CAPCOM Roger, roger, roger. IR ON.
SC Say again, Gordie.
CAPCOM We copy. IR on. Over.
CAPCOM America, we'll take the high gain now.
PITCH minus 15, YAW 188. Over.
CAPCOM America, Houston. Let's try the high
gain now. I see you're moving it. Minus 26 and 199.
SC Okay, I think we've got a main load lock
now on the high gain. How do you read?
CAPCOM You're loud and clear, Jack. It looks
good here.
SC Okay, Gordie. Let me keep going here.
I did not turn the IR on cause I thought you said something.
IR is going on now.
CAPCOM Okay, what I said is Roger, IR on.
SC Coming on. Mapping camera going in
stand by.
CAPCOM Okay, stand by on the map camera.

END OF TAPE

SC Okay. I'm awaiting your cue for pan camera power, to power.

CAPCOM Roger. We're still locking up on the data. We'll give you a cue.

CAPCOM Okay, Jack, you have our cue for pan camera power to power.

SC Okay. Pan camera going to power. Okay, Gordo we're in the SIM BAY door jet attitude.

CAPCOM Roger.

PAO This is Apollo Control 84 hours 6 minutes ground elapsed time. Present distance from the Moon -

SC Pan camera power is going to boost.

CAPCOM Roger.

PAO Velocity 3763 feet per second. Next major maneuver is Lunar Orbit insertion, which presently is scheduled for 88 hours 54 minutes 22 seconds ground elapsed time. Total DELTA-V or change in velocity which will be retrograde of 2988 feet per second. Service propulsion system engine burn time of 6 minutes 38.08 seconds. Mother Earth is 206 059 nautical miles behind Apollo 17, and locked up on the high-gain antenna at this time so we should have fairly good communications all the way through the SIM BAY door jettison and until the spacecraft passes behind the Moon prior to the Lunar Orbit insertion maneuver, which now is some 4 hours and 37 minutes away, roughly. At 84:07 standing by live on air-to-ground this is Apollo Control.

SC No, down there.

SC No.

SC (Garble)

SC Houston, I'm in VOX now. Do you read?

CAPCOM Yes sir. You're loud and clear.

SC Okay. I'm now 181 a logic power Main A, Main B circuit breakers are closed.

CAPCOM Roger.

SC Okay. Logic power number 1 is going to jet, number 2 to jet. Standing by for your go Houston.

CAPCOM Okay. Standby.

CAPCOM America, you're GO to jet to SIM BAY door.

SC Okay, Jack let me know when you've got the camera ready.

SC Okay, Houston. You said we are GO to jett the SIM BAY door a little early, huh.

CAPCOM Well, standby (garble) we're backing down here. Stand by one second.

SC Okay.

SC No. I checked it at one (garble).

SC Might check it.

CAPCOM Okay America. Once again, you're GO to jett the door and you can do it early if you wish.

SC Okay, Gordo. We'll do it on Ron's mark
down there.

CAPCOM Okay.

SC Hey Houston. This attitude - this
attitude has the sun right into window 5. It's probably going
to be on the lens of the camera. I'll - I'll try to shade it the
best I can but I don't have an awful lot of hope for these
pictures.

CAPCOM Roger.

SC I think we're probably stuck with it Jack,
because we need to be in this right attitude, for the
clearance and -

SC Okay, SIM door jett 5, 4, 3, 2, 1, jett.

SC Ah, I got a good bang. Did you hear that?
Houston, there it goes, I got it out the hatch window and it
looks like it was a clean jet. It's rolling and pitching and
yawing slightly. There's a lot of garbage that came out with it
can you take a picture Gene?

SC (garble)

SC (garble) let me see it. Ah, laughter),
you take a picture. Yeah, there it goes.

SC Hello Houston, how do you read?

SC It certainly -

CAPCOM (garble) Sounded good.

SC Okay. Did you get to where we got a clean
jett.

CAPCOM That's right, Geno.

CAPCOM Sounds good.

SC Okay. The door's moving, the door's moving
directly away from us, mostly rolling. And it looks like it was
a very clean, clean separation.

CAPCOM Okay.

SC Yeah.

SC Boy we got a good bang out of it. You could
hear that pyro going, I think. It's rotating at about 5, -
about 1 revolution per 5 seconds.

CAPCOM Roger.

SC And it's rotating, what about the long
axis? Yeah. Rotating about the long axis.

SC Houston. The garbage that I said went with
it was just a small amount of debris, I'm sure on the sealant pyro
area. There was one, oh about a 4 foot length piece of oh, 1 or
2 in. tape- like material that also went out with it.

CAPCOM Roger Gene.

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SC (Laughter) Okay. What do we do with these
logic power switches. Don't they go back to OFF now?

SC Door jett's off then.

SC Okay. You going to deploy/retract on
number 1.

SC Deploy/retract to number 2.

SC Fuel cell react valves are normal. I'm sort of
glad we had those in latch.

SC Yeah, me too, 'cause that's a pretty good bang

CAPCOM You've loaded the wrong pitch angle there
in NOUN 22.

END OF TAPE

SC Well, I got 10 degrees loaded, that's what we've got copied down here in the change.

CAPCOM Maybe there's some mistake, let us check here, Geno.

SC Okay, we got 320010 at 324 and before I go to maneuver, I'll roll right about 12 degrees.

CAPCOM Right call, Gene. Our error; you're right.

SC Thank you, sir.

SC Okay, and the UV spectrometer is going to go on here. Mark it.

CAPCOM Roger. Mark the UV.

SC Okay, and the IR will be off on your cue.

CAPCOM Okay, Jack, that'll be 12 or 15 minutes from now.

SC Okay, just give us a call.

SC Okay, the 100 watt 02 heater circuit breakers coming open.

CAPCOM Okay, Jack.

SC Okay, 02 heaters 1 and 2 going to auto, and 3 off.

CAPCOM Roger.

SC Okay, Gordo, we'll wait until 50 past the hour and pick up the LM/CM Delta P; we're stirring .6.

CAPCOM Roger. That sounds good.

SC And we're in the process of maneuvering and I guess I'll start to see if I can't get you some biomed.

CAPCOM Okay.

SC I don't know whether you were watching the LMB on the door jett, did you see a jett on my heartbeat?

CAPCOM Well, we'll check this data here, Jack.

SC I guess I was remembering erroneously 15's comment that it was very quiet, but I - of course Ron reminded me they were in the suits.

CAPCOM Okay, Jack, John Young was talking about the same thing here, but we didn't see anything on your EKG.

SC How stable could you get?

SC And Houston, 17 here, mag Bravo, Bravo is indicating 20 - let's see - indicating 76 percent now, 76 percent full.

CAPCOM Okay, Ron.

SC And, Gordo, we are watching the 8 ball.

CAPCOM Roger, we're keeping an eye on it too.

CAPCOM Mike, we'd like the high gain to auto, please.

SC Okay, you've got it to auto, I think we may have made a new discovery about microphones up here.

CAPCOM Oh, is that right, what's that?

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SC Well, Gordy, it looks as if you could improve your voice quality by putting fingers over the end of the mike boom. At least that works on the intercom.

CAPCOM How about that?

CAPCOM Mike Houston, we're ready for the IR's to OFF.

SC Okay. IR's coming OFF. Mark it.

END OF TAPE

SC Say, Gordy, whose operating in the trench today?

CAPCOM Okay. It's the LOI and Descent team, Presley Green and Deiterich.

SC Their a trio of musketeers if I ever heard one.

CAPCOM Rog.

SC All they lack is a French accent.

CAPCOM A New York accent is about the best they can do.

SC I wasn't going to exercise any value judgements Gordy.

CAPCOM Jack, this is Houston. I have a preliminary LOI Pad any time it's convenient.

SC Okay, Gordy. I was just checking to see if I could find the Moon and I still can't see it out there.

SC I'll be with you in 30 seconds.

CAPCOM Okay.

SC Okay, Gordy. Go ahead.

CAPCOM Okay. This is a preliminary LOI SPS/G&N. 66361 plus 121, minus 012 088 54 2271 minus 27988 plus 10457 minus 00373. Attitude is all zeros. HA is 01701 plus 00525 29880 638 29817, Sextant Star 45 2521 135. Boresight star and all the rest is NA. GDC align stars Sirius and Rigel, 122354 000. Ullage none. Remarks: LM weight 36312 and single bank burn time is 651. Go ahead.

SC Okay. Preliminary LOI SPS G&N. 66361 plus 121, minus 012 088 54 2271 minus 27988 plus 10457 minus 00373. All zeros, all zeros, all zeros. 01701 plus 00525 29880 638 29817 45 2521 135. Sextant Stars are Siris and Rigel, 122354 000. no ullage. LM weight is 36312 and single bank burn time is 651.

CAPCOM One correction on the ignition time the seconds are 2277.

SC Okay 2277.

CAPCOM That's affirmative, otherwise good readback.

SC Okay, Houston. - -

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/10/72 09:40 CST 84:47 GET MC317/1

SC Okay, Houston. At 84:45 we've got about 2 1/2 to 3 minutes and 1 frame a second on mag Bravo Bravo through the celestial adapter of the Earth.

CAPCOM Okay, Ron. We caught that and if you're looking for the Moon, according to our figures here, it should be visible on window number 1 about 30 degrees off the boresight axis. Over.

SC Okay, got 'cha. I'll try again.

CAPCOM America, Houston. I'm ready with a TEI-4 pad anytime it's convenient.

AMERICA Stand by. Okay, Gordy, I'm ready for TEI-4 pad.

CAPCOM Okee-doke. It's TEI-4 SPS/G&N 40090 plus 050 plus 117. Ignition time is 097:20:47.45. NOUN 81 plus 20048 minus 29511 minus 15473; attitude will be 202 083 312. Rest of the GDC align stars are Sirius and Rigel 133 200 030; ullage 4 jetts 12 seconds; and remark number one: Burn undocked; number 2: assumes no DOI; number 3: assumes landing site REFSMMAT; number 4: with the LOI REFSMMAT, your attitude will be Roll 180, Pitch 220, yaw 38 - correction - yaw is 338. Over.

AMERICA Okay, TEI-4 SPS/G&N 40090 plus 050 plus 117; 097:20:47.45; plus 20048 minus 29511 minus 15473; 202 083 312. Rest of pad N/A. Sirius and Rigel 133 200 030. 4 jetts, 12 second ullage. Remark 1: Burn undocked 2: no DOI assumed; 3: landing site REFSMMAT; 4: LOI REFSMMAT attitude 180 220 338. Over.

CAPCOM Okay, that's a good readback.

CAPCOM America, Houston. If you give us ACCEPT, we'll pop up a state vector - a preliminary state vector and a VERB 66, preliminary target load and a LOI REFSMMAT. Over.

AMERICA Okay, Houston. You have it.

AMERICA Okay, Houston, this is America. How do you read the commander on biomed?

CAPCOM Stand by. I'll take a look here.

CAPCOM America, Houston. Looking at the 02 pressures we think maybe tank 3 isol valve got jarred closed. Would you check the barber pole over on panel 278. If it's barber pole, would you re-open the valve?

AMERICA Gordy, we checked that. I'll check it again but we checked it right after the jett. And Gordy, it's gray. Would you like me to cycle it?

CAPCOM That's affirmative, Jack. Go ahead and cycle it open.

AMERICA Okay, that's been done.

CAPCOM Roger.

APOLLO 17 MISSION COMMENTARY 12/10/72 09:40 CST 84:47 GET MC-317/2

CAPCOM America, Houston. It's your computer.
You can go back to block.

AMERICA Okay, we're back to block. In the
Delta V test I got a minus 22.0 and I'm on a biocheck
right now.

CAPCOM Roger.

CAPCOM America, Houston. The biomed looks
good on all three of you.

AMERICA Okay.

END OF TAPE

SC And the null bias check, on a plus 100,
it went to 100.4. I'm working on the minus now.
CAPCOM Okay, sounds good.
SC Okay, the minus 100, it ended up minus 99.5.
CAPCOM Okay, Ron.
SC Gordy, the emergency cabin pressure regs
are off.
CAPCOM Roger.
SC Okay, equalization valve in the tunnel
has come open.
CAPCOM Roger.
SC Okay, Gordy, the LM tunnel valve is in
LM press, and equalization valve is closed.
CAPCOM Roger, and was it a 6 tenths Delta P
when you started this, as before?
SC That's affirm. It was 6 tenths and now
it's down, to, we been seeing that, and it's about .1.
CAPCOM Roger.
SC Okay, Gordy, we're changing mags on the -
the EL camera, and mag November - November is being stowed
with 59 frames on it, or 59 frames used. 159.
CAPCOM Okay, Jack, copy.
SC Gordy, you can record that as the
second commander's P52 that came up all balls.
CAPCOM Okay, we'll get a hard copy.
CAPCOM Okay, we got the 93's; you're clear to
torque.

END OF TAPE

SC Okay, Gordo, there's the gyro torque angles.

CAPCOM Okay, we're copying them down. Stand by.

CAPCOM Okay, Geno, torque them.

PAO This is Apollo Control at 85 hours 45 minutes ground elapsed time into the mission of Apollo 17. Presently 7900 nautical miles out from the Moon and approaching at 4009 feet per second. We're still about 3 hours and 8 minutes away from lunar orbit insertion maneuver, which will place the Apollo 17 spacecraft into a 52 by a 170 nautical mile lunar orbit. Earlier today, Gene Cernan asked Mission Control for suggestions concerning his gas symptoms. A decision has been made for the flight surgeon to consult privately with Cernan to discuss these symptoms. There's no indication that this situation will have any effect on the progress of the mission. A summary of the conversation will be released shortly. Meanwhile, for distance back to earth, Mother Earth stands some 208 068 nautical miles behind Apollo 17. We have 2 hours and 56 minutes remaining until the first loss of signal as Apollo 17 passes behind the Moon. 3 hours and 7 minutes and 50 seconds until ignition on the lunar orbit insertion maneuver, which presently is scheduled for a ground elapsed time of 88:54:22. Total burn time on the SPS engine of 6 minutes 38 seconds, for a total velocity change in retrograde of 2988 feet per second. At 85:47 ground elapsed time this is Apollo Control.

PAO This is Apollo Control 85 hours 50 minutes ground elapsed time. Here in the Control Center, the Flights Dynamics Officer Jay Green, just passed up to the Flight Director Neil Hutchinson, the latest predicted figures for the S-IVB impact. The present predictions on time are for the S-IVB to impact at ground elapsed time of 89 hours 39 minutes 43.4 seconds. The coordinates of the impact are predicted to be 4.12 degrees south latitude by 12.22 degrees west longitude. 3 hours and 3 minutes to lunar orbit insertion ignition. 2 hours 51 minutes until Apollo 17 passes behind the Moon for the first time. Distance from the Moon, presently 7653 nautical miles, velocity ever increasing, now 4032 feet per second. At 85:51 ground elapsed time in the mission of Apollo 17, this is Apollo Control.

END OF TAPE

CAPCOM America, Houston, we've lost the high gain and data. Go on OMNI ALPHA.

CAPCOM America, Houston. Those lines - go OMNI ALPHA.

CAPCOM America, this is Houston. How do you copy?

SC Clear, and we're OMNI ALPHA. If you don't answer this transmission, we'll try the high gain again.

CAPCOM Okay, Jack. We're reading you now. I heard you say OMNI ALPHA. Say again, the first part.

SC Roger. We've been reading you. I think you're on VHF however. Would you like us to reacquire high gain?

CAPCOM Stand by. I'll check on that.

CAPCOM Okay, Jack. We'd like you to try the high gain at a PITCH of minus 29, YAW at 17, manual and wide.

SC Okay, Gordie, we're on the high gain.

CAPCOM Okay, Jack.

SC How do you read?

CAPCOM I'm reading you - I can read you, but there's still a lot of background noise.

SC Like VHF would sound, but I'm not sure I believe it.

CAPCOM Jack, we just commanded normal voice.

SC Gordie, do you think you can hook up somehow out of normal voice?

CAPCOM Jack, we'd like you to try a normal acquisition. Go AUTO and narrow on the high gain..

SC Okay, that peaked it up, AUTO and narrow.

CAPCOM Okay, you're loud and clear now.

SC Okay, Gordie. You said that you had to command normal voice. Did we get a spurious command in there some way.

CAPCOM Okay, we did all that ourselves to establish voice through Ascension, no problem. Over.

SC Okay, Gordie. How did you reach us when you finally started calling?

CAPCOM Stand by.

CAPCOM Jack, we didn't do anything to cause the problem there, we were uplinking through Madrid and downlinking through Ascension. Did you see anything onboard that could have caused the loss a lock?

SC No, sir. We had good signal strength. It wasn't peaked for the high gain. It was more like an OMNI signal strength about 70 percent. And we called you several times after the switch in lines, and then finally, you came through, clear, but with some background noise and sounded like VHF. I presume it wasn't, now. And when you called, I went to OMNI ALPHA, with no change in signal strength, still about 70 percent, and you were still coming up the same way, and apparently, didn't hear us. And then the high gain - with high gain acquisition, it's been pretty clear.

APOLLO 17 MISSION COMMENTARY 12/10/72 CST 10:45 GET 85:52 MC-320/2

CAPCOM Okay, that stories the way it sounded to us. And we're looking around here to see if we can figure out a reason for loss there.

SC Okay, and I'm ready to pressurize the SPS, if that's what you want.

CAPCOM Okay, let me make sure here.

CAPCOM Okay, Jack. We're ready for it.

SC Okay, you want me to just use SPS helium valve 1?

CAPCOM That's affirmative.

SC Okay, Gordie. We're going to ON with SPS helium valve 1. We checked the circuit breakers, they're in.

CAPCOM Okay.

SC Okay, pressures up, fuel pressure is stable at 175 and oxidizer at 175, and the light is out. And we're back to normal on caution and warning. And the valve now is back to AUTO.

CAPCOM Roger. Looks good here. We're reading 184 on oxidizer and 180 -

END OF TAPE

SC Hey, Gordy, this is the LMP, I got a question
for you.
CAPCOM Shoot.
SC I'm just wondering if I'm showing about 85 amps,
and is that a good normal power load with - -
CAPCOM Just a second, we'll check that.
SC I'm just trying to reestablish my references
here for LOI.
CAPCOM ECOMM says the heaters are on and that's the
normal load.
SC Houston, 17.
CAPCOM Go ahead.
SC Well, I guess we're getting about an hour
rest sitting around here. We can go to wide deadband, if you
want, if you remind me to go back to there.
CAPCOM Let me check on that.
CAPCOM Ron, we suggest just staying where you are on
the deadband, there's no problem on show.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/10/72 11:20 CST 86:27 GET MC322/1

CAPCOM America, Houston. We just finished a site handover. And we're seeing some excessive counts on the UV. We'd like to chase the problem a little and to do that we'd like you to turn the UV off for 5 seconds and then back on. Over.

CAPCOM Ascension COMM TEC, Houston COMM TEC,
Net 1 voice check. How do you copy?
SC Ascension COMM TEC, I read you loud and clear.

CAPCOM Roger, Ascension.
SC Houston, 17 how do you read after a command reset?

CAPCOM 17, this is Houston. You're loud and clear.
You been calling?

SC Yes sir, we've been calling. After your handover we heard your statement that you handed over and then hadn't been able to contact you after that. I just hit a command reset.

CAPCOM Okay, Jack, that was a problem here on the ground. Over.

SC Okay.

SC Say, Gordy, 17.

CAPCOM Go ahead.

SC Now we've got B duplex - B simplex on, apparently left over from the LM checks. I suspect I should turn that off. Right?

CAPCOM That's affirmative.

SC Houston there, 17.

CAPCOM Go ahead.

SC Gordo, just an interesting observation. All the air bubbles in the beverage packs - you know none of the air bubbles will come together at all. If you get it in a small air bubble it stays in a small air bubble. And they'll never -

CAPCOM Okay.

SC Most of the - most of the spoon bowl packs you know. Or wet packs, whereas the juice bags won't do it.

CAPCOM Okay, that's interesting. I sure don't know why either.

SC Now that you won't let us look at the Earth anymore, we'll start looking in the cabin.

CAPCOM Okay, while you're looking in the cabin I've got a new hydrogen cryo configuration for you to minimize the pressure cycling and cut down the wear and tear on the motor switch. If you're ready to do it, I'll read it.

APOLLO 17 MISSION COMMENTARY 12/10/72 11:20 CST 86:27 GET MC-322/2

SC Go ahead.
CAPCOM Okay, on H2 tank 1 and tank 2 heaters, both of them off. On the fans, tank 1 fan's ON, tank 2 Fan's OFF. I think they're there already. And tank 3 fan's AUTO. Over.

SC Hey, there's a new configuration. Okay, H2 heaters 1 & 2 are OFF. H2 fans - 1 is ON, 2 is OFF, and 3 is AUTO.

CAPCOM Okay, sounds good.

SC That sounds like an EECOM special.

CAPCOM That it is.

SC Okay, Houston, I've got the limb of the Moon.

CAPCOM Very good.

SC I've got the limb of the Moon out the - got it out the center hatch and we're just barely seeing a - barely seeing the horizon of the Moon. But boy, is it big.

CAPCOM Roger.

SC Well, that must be a - what - you know talking about a sliver of the Moon, that is a sliver of a sliver. Gordo, we're coming in right down on top of it. What's our perigee did you say? Should be 73 miles.

CAPCOM Roger, that's about right. Don't worry, you'll miss it.

SC I just want to hear you say it 'cause I'm going to hold you to it. As long as you shadow your eyes from the Sun - the Sun is just about laying on the horizon of the Moon and as a matter of fact, as I watch it I can watch the horizon - the amount of - of daylight terminator get larger.

CAPCOM Roger.

SC Gordy, unless I'm proven wrong here, I think we'll be able to watch it all the way in as long as we can keep the shadows from the Sun.

CAPCOM Okee-doke.

SC I'll tell you, when you get out here it's a Big Mamu -

END OF TAPE

SC Gordy, it's a sight to remember. Not just because of the uniqueness of the view, but because we all have got to ask ourselves if we really know where we are and what we're really looking at right at this moment and when you answer that question, it's yes, it certainly becomes an epic sight in your mind.

CAPCOM Roger, Gene.

SC My congratulations to the trench for solving another rendezvous - rendezvous problem.

CAPCOM Rog.

SC Gordy, can you tell us how far we are right now from the ah - from the Moon?

CAPCOM Surely can, stand by.

CAPCOM Right now, you're about 5000 miles from the surface.

SC 17.

CAPCOM Go ahead.

SC I think I got a visual on the SIM BAY door now out window five. It's just about directly off our present plus Y axis.

CAPCOM Okay. Must be way out there by now.

CAPCOM Roger.

SC Gordy, what's the MOCR having for dinner this Sunday?

CAPCOM Well, let's see. I guess we haven't sent out for hamburgers, yet. There's a few brown bags in sight but that's about it.

SC Gordy, it doesn't look like I'll have a chance to go to church today, but under the circumstances I guess it'll be okay. Next time you see the good Father, you might have him put a good word in for us.

CAPCOM Okay. I'll do that.

SC Gordy, is - in our present attitude I see the lip of the Moon convex down toward our minus X axis. That's out of the hatch window. Can you tell me which is the north and which is the south pole?

CAPCOM Okay. Stand by.

SC Yeah, I'd be all squared away if the Moon were on Jack's side. Because he's got that end on his head, but, I'm a little mixed up now.

CAPCOM Roger. I understand your problem.

SC Gordy. I'm thinking the top of the LM towards the Sun, is probably the north.

CAPCOM Rog.

SC Gordy, I think I got it. The north has got to be on the right as I look at the lip of the Moon

SC opposite the sun, because when we go into retrograde attitude - ahh, it's got to be over there. I think I can see Korolev without any problem. It's a little bit north of the equator.

CAPCOM Roger.

SC Gordy, are you still with us?

CAPCOM That's affirm, I'm with you.

CAPCOM I'm getting lots of advice here.

SC Okay - - Okay. I bet you are. But, I think I've got it oriented. You can literally watch yourself fall down in. As we get closer, if we're going to have a view like this, it's going to be pretty dramatic, because we're calling the way you climb on out of the Moon when you leave it. If you can see, and I remember remarks at that time, Gee if we could see it like this when we came back in, we'd have to close our eyes. If we can see this thing coming in like I think we may be able to see it, at 50 miles it isn't going to look like very much.

CAPCOM Roger. We agree - -

SC Considering the window - . Gordy we're considering - -

SC Gordy we're considering putting the window covers on.

CAPCOM Your chickens, huh.

SC It's going to be one of those high angle energy conversion round outs.

CAPCOM Rog. From our information here, if you're looking at the Moon so that the, the dark limb is up, then North should be to the right.

SC Yeah, I concurred that's the way it is.

CAPCOM Roger.

SC The horizon is just steadily growing bigger.

CAPCOM Does it look about the same as last time?

SC What do you mean last time? A couple of years ago?

CAPCOM Right.

SC Gordy, we never saw it coming in a couple of years ago. We saw it, as I recall, a day out and we saw just a shadow of the limb, but we - From my best recollection, we never saw it this close. As a matter of fact, we went into darkness prior to going into LOI and this time, much to my amazement, we don't. But, I see now that we won't and I see why.

SC I'll tell you, everyone whose seen that view leaving, knows how fast you climb out and by golly, the closer we get to it the faster we're coming in.

CAPCOM Rog.

END OF TAPE

PAO This is Apollo Control at 87 hours 16 minutes ground elapsed time in the mission of Apollo 17. Some 1 hour and 38 minutes until ignition on lunar orbit insertion. Presently, the spacecraft is 4243 nautical miles away from the Moon. The Moon is getting larger, as noted by the crew. They considered closing the window shades in the spacecraft. Velocity now 4544 feet per second. Some numbers on acquisition of the spacecraft. With the burn - a normal burn, the acquisition on the east limb of the Moon would be at 89 hours 16 minutes 29 seconds. Without a burn, it would be somewhat sooner, 89 hours 7 minutes 46 seconds. A private conversation was conducted with the Apollo 17 crew from ground elapsed time of 85:46:55 to 86:04:46. The subject of the conversation was Gene Cernan's request for suggestions concerning alleviating some gas symptoms he had during the flight. The following is a summary of the conversation. The call to the crew was made by Donald K. Slayton, Director of Flight Crew Operations. Dr. Royce Hawkins, Chief of Medical Operations at MSC asked Cernan to explain his symptoms. Cernan reported it was no great problem, but that he has had some greater gas discomfort than his fellow crewmembers. He said he felt quite fine at this time, and there was never any pain or nausea associated with the discomfort. Cernan advised Dr. Hawkins of the anti-gas medication, symethocone, he'd been taking. Dr. Hawkins recommended to Cernan that he continue the medication after meals and before going to sleep. Hawkins also advised Cernan on some changes to his menu over the next 2 days to reduce the discomfort. Cernan reported quote "I'm better, there's nothing detrimental or incapacitating about this; we're all in good shape. We hope things are looking as good down there as they are up here." close quote. Lunar Module pilot Harrison Schmitt reported the crew had encountered some difficulty with the onboard system that separates gas bubbles from the drinking water supply. Schmitt was advised that the gas separator system has given the crews problems on previous Apollo flights. Astronaut John Young Commander of the Apollo 16 mission, and Back-up Commander for Apollo 17, also, talked briefly to the Astronauts, and wished them well. Distance now 4125 nautical miles from the Moon. Velocity 4570. Still an hour and 35 minutes, mark, until ignition on lunar orbit insertion burn. At 87:19, this is Apollo Control.

SC Gordo - The widest - most part of the convex horizon probably covers a good couple of degrees. I can now see relief on the horizon itself against the dark space.

CAPCOM

Roger.

SC And the rim of Korolev is readily visible standing out by itself in the darker or the unlit of the Moon. I can see - the central peaks are not very well lit up.

SC Okay, Gordie, this is Jack. Is there any reason not to start the checks in about -

CAPCOM Stand by.

SC Okay, Gordie, what I called a central peak or range in there must undoubtedly be that inner ring, but the way it was lit up in the central range.

CAPCOM Roger, and for Jack. No problem starting early on the checks.

SC Okay, they're in work -

END OF TAPE

SC All right, Houston, when you put the UV cover open, how long?
CAPCOM Okay, Jack, and we'd like 5 minutes of operation with it open.
SC Okay, mark it, open.
SC Okay, Houston, 17, I've started the secondary glycol pump, and I neglected to make a check on evap temperature, do you have that and did we get a decrease?
CAPCOM Stand by. Looks okay, Jack.
SC Okay, Gordy, there's NOUN 05.
CAPCOM Roger.
SC And you're looking at the torquing angle.
SC Okay, Houston, I'm going SPS pressure indicator to 2.
CAPCOM Okay, Jack, and you can close the UV cover, and go ahead and roll back to 064 roll. And you're clear to torque P52.
SC Okay. UV cover is closed.
SC Okay, Houston, I'm going back to SPS pressure indicator 1.
CAPCOM Okay.
CAPCOM America, Houston, we still see the UV door open. Have you closed it yet?
SC Okay, it's now closed, Gordy.
CAPCOM Roger.
CAPCOM America, Houston, I have the LOI and map update pads when you're ready.
SC Okay, Gordy, what - do you have a map update on page 3-83 of the Flight Plan?
CAPCOM That's affirmative.
SC Why don't you go ahead.
CAPCOM Okay, it's for rev 1. AOS without burn is 089:07:46; with the burn it's 089:16:29.
SC Okay, without the burn it's 07:46 and with the burn it's 16:29.
CAPCOM That's affirmative, and then I have your LOI maneuver pad.
SC Okay, we're ready to go.
CAPCOM Okay, LOI SPS/G&N: The weight is 66361; plus 121; minus 012. Ignition time is 088:54:21.74. NOUN 81: minus 27988, plus 10449, minus 00425. Roll, pitch and yaw are all zero. NOUN 44: 01701, plus 00525; 29877. Burn time is 6:38, 29814. Sextant star is 45,2521,135. Rest of the PAD is N/A. GDC align stars are Sirius and Rigel, 122,354,000. Ullage is none. Then marks LM weight: 36312. Single bank burn time i:s 651. Over.

APOLLO 17 MISSION COMMENTARY 12/10/72 12:15 CST 87:22 GET MC-325/2

CAPCOM Stand by on the readback.

CAPCOM Okay, we'll take ACCEPT and give you the up-links while you're reading it back.

SC Okay, Gordy, here's your readback. You've got ACCEPT. It's LOI PAD SPS/G&N 66361, plus 121, minus 012,088 54,2174, minus 27988, plus 10449, minus 00425,000,000,000, 01701, plus 00525, 29877, 6:38, 29814, 45,2521,135. Rest of the PAD is N/A. Sirius and Rigel 122,354,000. There's no ullage. LM weight: 36312. Single bank burn time, 6 plus 51.

CAPCOM Okay, that's a good readback.

CAPCOM It's your computer America and you have a state vector, a VERB 66, and a target load. Go back to VOX.

SC Okay, it's in VOX Gordy. We're finishing up on the bottom of 3-79.

CAPCOM Okay.

SC And I can just roll attitude. I've got the big old Moon again, and from where I sit it looks like we're right on target. Fifty miles above target, I like to add.

CAPCOM Okay, that sounds good.

SC The limb is, of course, still growing and a little more rapidly. And what I can see of the limb that's not blocked out by the sun, it's getting obviously much larger in the window.

CAPCOM Roger.

SC Now I guess it depends on the shadowing of the sun as to whether or not we're going to see too much. I think retrograde, we ought to see quite a bit once we get over the terminator.

END OF TAPE

SC Gordy, there's enough of the lighted portion of the moon where you can see the relief - not just a shadowing relief but the actual relief of several craters as they stretch across the terminator both to the north and to the south. I can see even more definite relief now on the horizon just to the north and behind Korolev. On the black horizon against space.

CAPCOM Roger.

SC The unlit part of the Moon, as you might expect, is just as dark from here as is deep space itself.

CAPCOM Roger.

SC It's black, I might say at this point.

CAPCOM America, Houston. For your information, your altitude is about 3 thousand miles now.

SC Okay, 3 thousand miles.

SC Gordy, the limb has much more 3-dimensional relief now. Towards us you can - you can get the feeling that the horizon - the lighted portion of the horizon definitely does flow in our direction. And although you can't see the unlit portion of the Moon, you get a feeling that there's a great deal more of it a lot closer than that which you can see.

CAPCOM Roger.

SC Okay, Gordy, the pre SPS burn SIM PREP is complete.

CAPCOM Roger.

SC I'll give my buddies a chance to look at it now.

CAPCOM Okay.

SC I never thought I'd see a geologist speechless at his first near - near shot at the Moon, but I haven't heard a word from him yet.

SC Rog.

SC This geologist turned engineer for about an hour.

CAPCOM He's probably speechless because there's no clouds to talk about.

SC Gordo, everything's looking good on board. We're just waiting for about 88:05. We'll be in our maneuver at that time.

CAPCOM Okay, everything looks good here also.

SC And is your LOS of about 45 still good?

CAPCOM I'll double check that.

SC America, the flight plan is correct on LOS. To be exact it will be 88:43:40.

APOLLO 17 MISSION COMMENTARY 12/10/72 12:35 CST 87:42 GET MC326/2

SC If - if you guys could get an idea down there of the needle you're threading when you shoot for 50 miles at a quarter of million, you'd be mighty proud of yourselves. I'll tell you, we are.

CAPCOM Roger.

SC I guess I really ought to wait and tell you that at 89:16:29.

CAPCOM Rog.

SC Say, Gordy, do you have any idea what our relative speed is to the moon at this time?

CAPCOM Yes, it 5 thousand feet per second. You're presently 26 hundred and 60 miles up.

SC I assume T.P. is there and I guess John is too. I don't know if John saw this coming in on 16 but I know they can recall what we saw leaving on 10 and other than the fact that you can't see as much of the Moon it's just as impressive.

CAPCOM Rog. I was just talking to John about it a couple of minutes ago. Their view on 16 was - they didn't have any Sunlit Moon but they did have some pretty good Earthshines.

SC Well, he knows what I'm talking about then.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/10/72 CST 12:47 GET 87:54 MC-327/1

SC Gordy, it's an unbelievable view through the monocular now. You can really see down in the depths of some of the larger craters, with a great deal of clarity. And you can see the - some of the higher ridges actually rolling right over the horizon as they go away from you.

CAPCOM Rog, Gene.

SC Hey, Houston, as much as I hate to, I think we're going to have to maneuver out of this attitude.

CAPCOM Rog. As you take your last look there, your presently 20 - just a little over 2000 miles up and your coming down about 4500 feet per second.

SC Gordo, there's only one better view than this.

CAPCOM What's that, Gene?

SC Right at the moment, anyway. Right at the moment anyway, is to be out there and watching this spacecraft maneuver in attitude and - and watch it burn over the Lunar Surface. I get the feeling someone is watching.

CAPCOM Rog.

CAPCOM Give us OMNI Charlie, please.

CAPCOM Apollo 17, Houston, we just had a site handover. That resulted in the LOS time changing 19 seconds. It's now 43:21.

SC Okay, 43:21 and we are on OMNI Charlie.

CAPCOM Roger.

SC And, just to round out things as we pitch back into LOI attitude, low and behold from over the top of the LM came the Earth.

CAPCOM Very good.

SC Got the whole thing in one big package.

END OF TAPE

SC Pretty interesting, Gordo, we can - we can see we're right over South America and, of course, we can see up the Gulf Coast. And it looks like Houston is covered with clouds, but poetically enough, we can see the Cape, at least we can see Florida.

CAPCOM How about that.

PAO This is Apollo Control, 88 hours 17 minutes into the mission of Apollo 17. Some 26 minutes now until Apollo 17 passes behind the Moon, coming up on the lunar orbit insertion burn in which the spacecraft will start its initial orbit measuring 52 nautical miles by 170 nautical miles, an elliptical orbit around the Moon. That maneuver will take place at a ground elapsed time of 88 hours 54 minutes into the flight, and will slow the spacecraft down considerably from its present velocity of some 5700 feet per second. Presently, the Apollo 17 spacecraft is 1528 nautical miles out from the Moon, approaching at 5730 feet per second. After the spacecraft passes behind the Moon 25 minutes from now, assuming a successful lunar orbit insertion burn, it should come from behind the east face of the Moon, the limb of the Moon, at approximately 33 minutes later. It'll take a few moments for the ground stations to lock up on the downlink from the spacecraft even though the theoretical contact time is roughly 33 minutes after loss of signal. At 88 hours 18 minutes ground elapsed time, this is Apollo Control.

SC Now VERB 41 NOUN 91, and I'm on VOX now.
(Garble) commander's flight.

CAPCOM Ron, you're loud and clear on VOX.

SC Okay, Gordo, we're in attitude now.

CAPCOM Roger.

SC Okay, Houston, the star sextant check is GO.
We've got it in the sextant.

CAPCOM Roger.

SC Okay, let's go ahead and go and do that P40.
22 - about 20 minutes. Well, it looks like it's going pretty close to where we want to be anyhow.

SC Okay.

SC Just back the other way.

SC Okay, Gordo, we're standing by in P40.

CAPCOM Roger, we're watching you.

SC Okay, everything is checking out good on board.

CAPCOM Roger.

SC Okay, let's go over the cue card. Okay, Delta V checks complete. Set the Delta V 2981.4. Okay, we have the pre-delta V in standby. And the SIM bay's been checked, Jack?

SC Okay, we're in Rate 2 on the BMAG's. Okay, no trim, we'll just leave twelve of them on then. I've checked the DAP. Check it again. Yep. BD, BD roll. Good. That's good. Plus 1.21, minus .12. Okay, the DAP is loaded. Okay, Houston, the DAP looks good.

CAPCOM Roger.

SC Okay, we're CMC and Auto. And we're at the PAD attitude now. Okay, boresight sextant star check is complete. And did it once, let's try it again. It kind of drifts quite a bit. Okay, the old GDC is aligned. Okay, Direct Ullage breakers are going in. Pitch 1. Yaw 1. BATT A circuit breakers are in. The rest of them are all in. DAP control and SPS are all closed. Okay, we have three of them in Rate Command. That looks like about deadband min rate low.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/10/72 CST 13:21 GET 88:28 329/1

SC SCS GDC is in rate command.
SC Okay, CG is in LM/CSM. Gimbal drive
PITCH YAW AUTO. PITCH and YAW in AUTO.
SC Okay, Gordo, we're down to 6 minutes in
the check list.
CAPCOM Roger, Gene.
SC Okay.
SC Okay.
SC Okay, we'll keep tight limits though
to 1 plus 10.
SC Okay, we'll go 25, 25 21. That's not it.
Tight limit is 3 plus 40.
SC 638, single bank burn time is 651. I'll start
off bank A first. That means we may get a chug from starting
bank B.
SC Yeah but if, okay.
SC Oh, my scissors flew up and disappeared
somewhere. I'll have a hard time eating if you guys take
all the scissors with you. My teeth are pretty good though.
SC Okay.
SC Okay.
SC That's unless you start a burn an hour and
20 minutes late with that it's burn time plus 5.
SC Okay.
SC Okay.
CAPCOM Apollo 17, Houston. If you're interested
in sticking around awhile, you have our GO for LOI.
SC Roger, Houston. Understand America
is GO for LOI. And let it be known that the crew of America
is GO for LOI.
CAPCOM Roger, that.
SC Got to worry about this camera back
here. It might come banging down.
SC Its up there yet.
SC Okay, panel 8 looks good.
SC Okay, 51 1-1/2 CMC GDC command rate command
rate command, limit cycle is off, dead band - min, rate to low,
trans control power to off, AC direct to off, at this time CMC in
AUTO, rate 2, rate 2, rate 2, GDC in rate command, gimbal
motors are OFF, LM/CSM, ELS is AUTO, I mean the ELS is manual,
RCS logic is OFF, ROLL is AUTO, .5 Gs, PC and GPI, gimbal
drives in AUTO. Everything looks good.
SC Put it in my pocket.
SC 12 minutes, a little better.
SC Hello, Gordie. As we approach LOS,
we've still got America out the view of the hatch window.
We'll see you at 89:16:29.
CAPCOM Okay, Gene. About 1 minute left till LOS.

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CAPCOM You have our wishes for a good burn.
SC Thank you, sir. We shall have one.
SC And Gordie, I assure you we will be
out at 16:40.

CAPCOM Very good.
PAO This is Apollo Control at 88 hours 43
minutes into the Mission of Apollo 17. We have had loss of
signal as Apollo 17 coasted behind the Moon on the start of
the first lunar orbit, 10 minutes and 28 seconds away from
lunar orbit insertion maneuver. A retrograde service pro-
pulsion system burn of some 2988 feet per second. Assuming
a successful burn, the spacecraft should come out from be-
hind the Moon at 89:16:29 ground elapsed time as Gene Cernan
promised it would before they went behind the Moon. At loss
of signal, the spacecraft was some 395 miles above the sur-
face of the Moon, traveling at a velocity of 7241 feet per
second. 9 minutes and 30 seconds - mark, until LOI ignition.
At 88:44 and returning just before acquisition of signal,
as Apollo 17 comes from behind the Moon, this is Apollo
Control.

END OF TAPE

PAO This is Apollo Control at 89 hours, 15 minutes ground elapsed time. Some 55 seconds until Apollo 17 comes from behind the Moon, on the start of the first Lunar Orbit. We're awaiting appearance of the spacecraft and word that the burn went successful, which apparently it has because the spacecraft without a burn would have appeared some 8 minutes ago. The ignition time is 88:54:21 in ground elapsed time. Should be getting lock on fairly soon, zero. That was the theoretical acquisition time. Of course, it does take a few seconds for the ground station to lock onto the signal from the spacecraft. We're awaiting word from the communications officer that we have indeed gotten a signal and telemetry from the spacecraft.

SC Okay (unaudible).
SC Yeah, it's (garble). Well, yeah it is.
There's AOS limits right there - -
SC I think we just passed Hertz's -
CAPCOM Hello, there, America. We hear you talking.
SC I don't know.
SC Yeah, I don't know.
SC Yeah, I thought it dropped out.
SC Hey, it dropped off.
SC Minus 43 and 345.
CAPCOM Hello, America, this is Houston, how do you read?

AMERICA Attitude? Yeah we're in attitude.
AMERICA 165, 60, 8 yeah, we're in attitude.
CAPCOM America, Houston. Over.
AMERICA Don't tell me the old high-gain crumped.
SC Okay. See you're in manual -
SC Yeah, we started to get it awhile ago.
SC Yeah, put it in auto and - there.
SC There.
SC The time.
SC Yeah, we're at the edge of Marginis
PAO This is Apollo Control. Here in the Control Center we are hearing the crew aboard the spacecraft of Apollo 17 very clearly, however the ground has not be able to fully lock up on the spacecraft with the so-called uplink, on the voice uplink. And apparently it has to do with the 85 foot antenna at Goldstone. We're continuing to stand by until the 2-way communications are complete. An hour and 20 minutes before loss of signal as we go across the face of the Moon, the front face of the Moon on the first Lunar Orbit. At 89:20 and standing by, this is Apollo Control.

SC Okay. It came in then.
SC There it goes.
SC Hello.
CAPCOM Hello America, how do you read, Houston. Over.
SC America - Houston, this is America you can breathe easier, America has arrived on station for the Challenge ahead.

CAPCOM Very good. We've been hearing you for a couple of minutes now. We've had a ground site problem, but you're loud and clear now.

SC Okay. That's what we sort of thought, Gordo. The SPS burn could not have been more nominal. I've got some numbers for you if you're ready to copy.

CAPCOM Go ahead.

SC Okay, TIG was on time, TIG was on time, burn time was 6 plus 33, VG is 29899, Roll was 008, Pitch 357, Yaw 006, all at the end of the burn. Residuals minus .3, plus .1, and 0. Delta VC was minus 6.8, oxidizer 34.0, fuel 34.5, unbalance is 110, decrease. The CMC holds us in a 170.3, by 52.5.

CAPCOM That sounds great Gene.

SC It was an auto ignition. It was an auto shutdown. I think any comments during the burn are on the tape. But, to me, it was probably the smoothest and quietest SPS burn I ever remember.

CAPCOM Roger.

SC Houston this is Jack. The PUGS was erratic, and the only thing that I noticed that was off nominal. It - It bounced around a lot, in bouncing around - it was initially for about a minute around oh, 1.8 decrease, then it gradually started to divert from that to a more decrease down to about 2.5 or make that 3 decrease. And I went to decrease on the switch and about the time of cross over, I had it at oh about 1 decrease and it crossed over and stabilized at zero and I went to normal and it stayed there the rest of the burn. Until just near the end it started to go decrease again.

CAPCOM Okay, we copy that Jack.

SC (Garble)

SC Okay, Gordo, did you by any chance get the S-IVB impact?

CAPCOM Ah, we're - Okay, the new impact time for that is 89:39, so we haven't quite got there yet.

SC Okay. Thank you.

SC And, Houston, Ron here. I think a little bit of a surprise to me when I turned on bank-A the chamber pressure came up to 87 percent, and stayed there essentially. Five seconds later I put on bank B the chamber pressure rose to a 90 - about 91 or somewhere in that area. And then, throughout the burn chamber pressure increased which you'll see on the strip chart. But I was sure surprised that only 87 percent when we started it. It looked like the velocity gained versus time was correct throughout the burn, though. The maximum the chamber pressure ever got to was about 97 percent, and that was toward the end of the burn.

CAPCOM Roger, Ron.

SC (Garble).

END OF TAPE

SC A little disappointed here, Gordo, I brought an airborne and a ground geologist along with me and it took him until AOS to make sure they knew where we were.

SC Ha ha. That's not true.

CAPCOM Roger.

SC My big problem was all the holes were hills when I first started. Looked just like you had the picture upside down.

CAPCOM Roger. I have a couple pan camera photo PAD's for you.

SC Go ahead, Gordo.

CAPCOM Okay, the first one goes in the Flight Plan at 90:45, and the start time is 090 50 32. Stop time is 091 10 57. Go ahead.

SC Okay, I got 090 50 32 and 091 10 57.

CAPCOM Okay, and next one goes on the next page. Start time is 091 18 05. Stop time is 091 27 43.

SC 911805912743.

CAPCOM That's right.

SC Okay, Gordy, I've turned the pan camera off there about 30 seconds ago and the post-SPS burn checks are complete. Logic - no, that's, well, just a minute. The post-SPS burns are complete down to a logic power 2. That'll avoid Retract. I'm not sure of Flight Plan.

SC Okay, Mode is stand by. Mark it. Power is on on the pan camera. Okay, Houston, we're waiting your cue on the power.

CAPCOM Okay, and add they'll be no update to the TEI burn PAD. Over.

SC Beautiful.

SC (Garble) Here's Smidley, gang, coming over mare - no, let's see, Crisium. Coming over Crisium. It's coming underneath us now.

SC I will have in a jiffy. Okay, I'm going to hang off then a little bit. Get a - boy, this window. And, Gordo, how did the spacecraft look to you as we came around.

CAPCOM Real good, Geno. Nothing to report.

SC Very fine. Thank you.

SC (Laughter) One little minor problem, Gordy, is that we're breathing so hard that the windows are fogging up on the inside for a change.

CAPCOM Okay, and we'd like the pan camera power on now. The pan camera on, good.

SC Beautiful.

SC Oh boy, there is Picard, or Peirce, one of the two.

SC Okay, Gordy, all those dark and light albedo changes around Picard and Peirce are not obvious at this particular angle yet. There's some hint of them.

CAPCOM Roger.

SC The rim - is there one farther south of Peirce?

SC (Garble)

SC Is the one farthest - Picard, yeah. Picard, I think, is the one I'm looking at.

SC Yeah, it is.

PAO Mark 8 minutes to S-IVB impact.

SC Behind the rendezvous antenna. Rendezvous radar. And - yeah, way out there, you ought to start seeing them.

SC I guess I ought to get that other stuff on the camera, huh?

SC Okay, we're just about over the top of Picard, and the rim materials which go out about a third of a crater in diameter as near as I can tell, are distinctly darker but not by much. They're more grey, really, then the grey tan, or tanis grey of the rest of the mare.

CAPCOM Roger. Now we assume you're all set up or about to get that way for the landing site photos.

SC Yes sir. There is no obvious ray pattern or secondary pattern outside of that blanket around Picard.

CAPCOM Roger.

SC I see no loops or obvious alignment that would be related to that crater. There are blocks - look like great big blocky areas on the rim.

CAPCOM Rog.

PAO This is Apollo Control, some 6 minutes 13 seconds away from S-IVB impact. The traces, seismograph traces from Apollo 14 and Apollo 16 will be visible in the news room video monitors. There will be a briefing in the small briefing room on the seismology of the impact. Some 5 minutes 43 seconds now away from S-IVB predicted impact.

SC Do they want the 80 millimeter lens on these terminators now.

SC There's Taruntius, Ron.

SC Yeah, I guess that's right.

SC I've got to get another magazine on it.

CAPCOM Roger, Gene, can you verify the position of the PU valve for us at this time for us.

SC Roger, it's in normal.

CAPCOM Okay.

END OF TAPE

AMERICA Macrobius, Macrobius.
CHALLENGER Oh, Microbus.
AMERICA Okay, I'm loaded up for your terminator
Ron. What's - Is it not out of 105 or what? Is it -
CHALLENGER 105 (garble).
AMERICA Okay, 80 millimeter or - 80.
AMERICA Okay,
CHALLENGER Millimeter.
AMERICA Okay.
CHALLENGER (garble) 153.
AMERICA 5 frames over the terminator, huh?
CHALLENGER 12 frames.
AMERICA 12 frames. Very good. How soon do I
start.
AMERICA Okay.
AMERICA Okay, in about 5 minutes, all right.
AMERICA Gordy, you'd be interested - there's
a crater that just on - on the west rim of Crisium. Relatively
fresh rim - fairly crisp rim - but no strong ray pattern.
There's no ray pattern apparent at all. It looks like it's
pre - the plains material around it - that - since they come
right up over the - right up to the edge of the crater in
one spot. That is Posidonius. That's right. That's what
I'm looking at.
CAPCOM Roger.
AMERICA Not Posidonius, Procolus. That's what
I'm describing.
CAPCOM Yeah, all right, you're looking where?
AMERICA Recognize organize 41. Infamous Procolus.
AMERICA Okay, give me a mark when I'm - hey
look the -
CHALLENGER Hey, I'll give you a mark, Jack.
AMERICA At the Cauche Rilles here. Man is that
neat. Let me see here. And aft to one right there with the
shadowed peak in there. Right? Yeah, yeah, yeah, yeah,
yeah. And that's out of this window, huh? I'm not -
PAO One minute marked S-IVB impact.
SC Here's the mare domes with the central
craters are certainly obvious. In southern part of -
sea of Deletiations that trend to the northwest through
this entire - entire section - they go through the - mostly
through the highlands.
SC I can get the pictures. Is it directly out
of window 5? Okay. We've got about another minute and a
half. I'm going to proceed here at 41.

SC That's the way we're going. I'm taking
them east-west.

SC Hey Jack, we're at - coming up on 40.

PAO We had loss of signal right on time
with the instrument unit of the Saturn IVB which - -

SC 140 - Okay, we're with you Gordo. Thank
you.

PAO Seismic signals beginning to come in.

SC You got - Okay. Don't forget the pro
Ron, you got 8 seconds.

SC Mark at 41.

SC Yes, we hit it.

SC Goes. With the usual FAO flight plan-
ning that was a good time.

CAPCOM Roger.

SC Hey, you can even see the horizon in
the Earth shine out there.

SC Boy, you sure can. You can see an
Earth lit horizon out there into the dark part of the Moon.

SC Can you see lightening side. I think
it's going to be in the darkness.

SC The shadows are so contrasting here, Ron
that I -

SC Give me that thing a minute.

SC I told you. There's le Monnier the
landing side. I can't - no it's just dark. Isn't it a
little north of (garble).

SC No, I think it's right below us, Jack.
I think it's right smack below us in darkness.

SC Yes, it is. I think I'm looking at
Littrow right there right below us. But, I can't quite
tell.

SC If I could see Macrobius I'd have a
better handle on it.

CAPCOM A reminder to go to S-IV and 1250 this
time on the last six pictures.

SC Roger. That's Posidonius alright.
Le Monnier, we're here early.

SC Boy, I tell you, there's no question
that right at the terminator you pick up relief that you
normally would not believe is there in the mare. I remem-
ber Bill Anders talking about the appearance of a sea swell
in the mare itself and that's certainly clearly shown right
at the terminator. Unless you start to see the shadows
from all the very small craters that other wise don't show
up as much more than little depressions, if that.

CAPCOM Okay, we need accept so we can give
you a landing REFSMMAT.

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SC Okay, you have it.
SC Yes. Okay, I think that will do her.
SC Okay, Houston. I cheated. I took
three extra pictures and those were at 28 in the 250 up at
the end.
CAPCOM Okay, Jack.
SC And, your times might have been a little
off because I was just about ready to loose the terminator
because of the maneuver - are we maneuvering or have we?
SC Yes.
SC But, I think we've got a good set going
up to the terminator.
CAPCOM Roger.
SC Plus a couple of shots - a few shots on
the CEX mag - no mag kilo kilo as we came around the Moon
and that numbers now on 20. Kilo kilo is 20 and caback caback
is 42.
CAPCOM Okay, we need the IR on now.

END OF TAPE

SC Okay, back to work.
CAPCOM It's your computer, the uplinks in there, and
go back to VOX.

SC (garble)

SC Yeah, enough tourist activity.

SC Warm in here, isn't it?

CAPCOM America, a couple of items. Would you
verify the S-band AUX TV switches in the science position. And
one other thing, we think you were in low bit rate during
the burn.

SC Okay, it's in science and we very
definitely were in high bit rate during the burn by the
checklist.

CAPCOM Roger, we may have a problem there because
it looks like low to us on the data. We'll check further.

SC Hey, Gordy, there was - Ron questioned -
brought up the question or possibility of not having gone
to command reset, but just before we left you, you'll
probably be able to see that I went command reset and turned
on the tape cause I remember seeing the tape motion.

CAPCOM Okay, Jack. We're discussing it - what
happened there.

SC Okay.

CAPCOM America, you can go back to VOX.

SC Okay, Houston. How do you read 17?

CAPCOM You're loud and clear, Jack.

SC Okay, before we really got concentrat-
ing on the burn, and I had an opportunity to - we all had
an opportunity to look at Korolevb, at a very low grazing
sun, one of the striking things was the - to me was the ex-
treme absence of relief, the very smooth surface that ex-
isted in Korolev, independent of course, of the craters
that are penetrating that surface. It looked like there
was a ring in the floor next to the wall about maybe 1/6
of a crater radius that was somewhat brighter at the low
grazing sun, suggesting it may have had a different slope.
And I believe I'm correct in saying that the inner floor
may be slightly raised. We'll try to make other observa-
tions this next time around on that one, but there was just
a very smooth floor, the light plains material in that
crater is very smooth.

CAPCOM Okay, understand. One quick word from
FAO's (garble) film watchers here.

SC And of course that's independent - -

CAPCOM Has to do with optional photographs.
We'd rather you take the optional photographs on either
OO or PP and reserve KK for the scheduled photographs.
And as it stands now, we've got to reserve 80 frames on

either 00 or PP for scheduled photography. Over.

SC Okay, you have to keep track of that.
We need, I was hoping we had an optional capability on our
first Rev and we'll work it out.

CAPCOM We do, we just want to put them on 00.

SC (garbled)

CAPCOM That's right, just put them on 00.

CAPCOM Jack, the problem on the high and
low bit rate there was a synchronization problem between you
the burn check and us on the ground on our pre LOS command.
No hardware problems, and I don't think it will be a problem
in the future.

SC Okay. But you did loose the high bit rate.
Is that correct?

CAPCOM That's affirmative. We just had low
bit rate during the burn.

SC Okay.

END OF TAPE

SC Okay, I may have jumped the gun on you there a little bit, but, I thought we were suppose to do that just before we went AOS, LOS. I think I did it about a minute before.

CAPCOM Okay. It was almost identical, simultaneous with our sending the command. You've got about 4 minutes to start looking at Copernicus coming here.

SC Okay. Thank you. We're just, Sun's just setting.

SC Okay, I have a visual on Copernicus.

CAPCOM And, by the way, the S-IVB crunched in on time and it's been ringing the ALSEP seismometers like mad for some time now.

SC VOX, and that's VOX. How do you read the LMP, Gordy?

CAPCOM Loud and clear, Jack.

SC Thank you, Okay, good. Alright I've got a visual on Eratosthenes and Copernicus. The, they're are obviously different age craters in this light. You can see the ray patterns in Copernicus moderately well. You can even tell that they do cross Eratosthenes. Stadius shows up as a very clear dark area to the southwest of Eratosthenes. Now, one of the things that we mapped on the southeast and south rim of Copernicus were dark albedo areas within the ejecta. And those are apparent, here very clearly. And also, within, on the upper portion of the rim and on the benches, in that quadrant, the walls, there are the dark spot lower albedo material that we mapped. They are, ... form linear patterns along the benches apparently. Although, the topography is not too clear, but the dark spots are in arcuate and linear arrangement, parallel to the rim. And they appear to have be elongate along radius. Along the radius of the crater.

CAPCOM Roger, Jack.

SC This is in the southeast, southeast quadrant I'm referring to. Copernicus H is also very obvious as a dark rimmed crater, relative to the albedo or the ejecta blanket. And the northwest quadrant, which we mapped as a smooth floor material and somewhat darker albedo is just as apparent here, although all the contrasts, of course, are less. The main thing that you can pick out in earthshine are albedo distinctions. Now, now we, I remember that we also at one time, and I can't remember whether it made the final map or not, mapped an arcuate fall structure, based on the change in albedo. And this was on the southwest quadrant of Copernicus. And that across the southern rim, more or less north/south, went down and curved across the floor and up the southwest rim, and that is a very clear arcuate pattern in this lighting. Darker albedo than the rest of the crater, and along the arc, there appear to be a couple or three even darker spots. Much as we thought we saw in some of the early photography.

CAPCOM Roger.
SC There is a general streaking, radial streaking, withing that arcuate dark area, that radiates, radially from the crater, and if I had to project, the dark area would, north, whose northeast terminus is the arc in the crater, I'd project it off to southeast about crater diameter and a half, maybe. Now, we're getting, essentially directly overhead, and again the dark spots within the crater wall are still apparent and the streaming or the radial elongation of these spots is clear. Now, on the lower wall, that's below the first bench, I can see four of these dark areas, and on the next wall above that, above the first bench, there are two, two obvious ones, and a couple that are somewhat more subtle.

CAPCOM Okay. (garble)
about in the Central Peak?

SC No, Gordy, I can't. There's very little indication of relief in earthshine and particularly at this high Sun angle, high Earth angle. Pardon the expression.

CAPCOM Roger.
SC The Central Peaks do stand out, though, as a much lighter albedo area within the crater. It looks to me like the best thing you can do in earthshine is work with albedos. Knowing the general topography from the, from the earlier photography. We're coming up on Kepler, now. Copernicus is out of my view in window 5. Maybe Ron sees it. Do you Ron.

SC No, it's out of my view now too.

SC Okay, we, we...

SC Can you see Reinhold over there?

SC Reinhold, I was not conscious of, yes, I can see Reinhold. Reinhold is one of the craters just like Copernicus that may have contributed ejectas in the Apollo 12 files. You see

SC And S-IVB, yes 16's S-IVB hit out there to the south, I think.

SC Well, I don't see anything that would indicate that.

SC Reinhold is an (garble) aged crater, as you may recall. It's crossed very obviously, even in this light, by the Copernican rays, which is prime, the main way we determine the age, other than it doesn't have any rays itself. Although, on the good photography we now have, we know it has secondary crater patterns around it.

SC You're not looking at the same crater I am then.

SC Reinhold is right down here Geno.

SC Where are you looking?

SC Well, it's south of Copernicus.

SC Okay, I'm looking up here.

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SC South and a little west.

SC I don't have the same view you have.

SC Okay, I can see Lansberg now. And I'm afraid
I can't shed any light, pardon the expression, on the old question
we've had about the age of Lansberg, relative to the Mare.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/10/72 CST 14:58 GET 90:05 MC335/1

CAPCOM Okay.

SC Kepler Ray pattern is very striking in this light and the (garble) series of bands which only average being radial. In most cases they're a little off the radial, but by joining together, they give you a general radial pattern. I just want to see a -- okay, out the window 4 I have an excellent view of Kepler. Once again, albedo differences, such as the -- are very clear -- such as the distinction between the wall light -- or brighter wall materials, and the rim, which in itself, is brighter than the surround mare. We can look right down some of the rays, and the rays are not completely linear. I'm looking now to the northwest. Gene, you could see Aristarchus way up there in the northwest. See it?

SP Yeah (garble)

SC You ought to have a good view of Aristarchus. Very bright up in the northwest part of our field of view.

SC The inside of that crater almost looks as if it's backlit.

SC That's right. Well, it should be. Strangely enough.

SC And, but -- these rays with contrast to the -- maybe the feeling one would have that they are -- once they get started, they form a linear pattern across the surface. They don't seem to have done that. As a matter of fact, they're quite strikingly curved along their pattern. They'll break from the general radius they're out on, curve away and then curve back. Some -- all -- let's see, there are 1, 2, 3, 4, 4 rays that go from out -- to the northwest of Kepler, all of which show that -- nonlinear characteristic.

SC Yeah, they're all radial, though.

SC They are radial, in general, but when you look at them in detail, only portions of them are radial, and a single ray which you could follow continuously, will bend then curve back.

SC The -- it's unique. We've got rays from -- I guess those must be Copernicus over here -- those long ones off to the right, which you might not be able to see. Kepler and Reiner are all intermingling up here.

SC Yeah, this is the area now we're going over where the gamma ray work on 15 indicated a relatively high radio-activity. And -- not yet, it's -- (garble)

SC Houston, America here. Do you see the torque and angle?

SC I was going to look for the Hortensian Domes near Copernicus, but got sidetracked with Kepler and missed them.

CAPCOM (garbled) Ron.

SC They are not obvious, though, in looking in the gen -- Okay, our torque 845.

CAPCOM Roger.

SC Okay, we're getting out into Procellarum -- Oceanus Procellarum proper now, and before long, should pick up the medial ridge that makes that mare so distinctive from the other mare. This is a ridge that stretches something like 2000 kilometers north to south, if you want to tie a vari -- a number of things together. And, probably is the lun -- the Moon's closest analogy to an oceanic ridge, which has -- which have been in the news over the last decade.

CAPCOM Roger.

SC Once again, the topography of the Procellarum Mare is not clear in this light. It's just not quite enough light to give you strong, distinct shadows. At least, not yet at this Earth angle.

CAPCOM Okay, and as you get the camera set up for the orbital science pictures of Galois with -- on a change, and use Magazine 00 instead of KK. That's listed in the flight plan at 9020.

SC Okay, we'll do that.

SC Okay, out of the window 4, I'm able to see some of the Rima gamma materials, and it's awful hard to say more than just the fact there is a very clear light-colored pattern off to the north. Of our position, at any rate. I think all I can say is that I've seen it. I can't give you much information on it.

CAPCOM Okay.

SC We can see the area where Maurius Hills should be, although it's not an obvious topographic feature in this light. Still see Aristarchus off up there shining like a star, if the Moon could have stars.

SC Okay, Houston. I'm going to torque those course line errors out at 12.

CAPCOM Roger, Ron.

SC And -- You squared away?

SC It's good to be able to see some stars out of the telescope. It's the first time I've been able to see any.

SC Gordie, we have a very clear zero phase point for the Earth light. It's certainly not a strong contrast for the Sun, but it's out there, and within it, again, the French craters tend to brighten quite a bit more than the surrounding mare. Still looking at Oceanus Procellarum. And, now, out Window 3, up to the northwest, Grimaldi is starting to show up. A very obvious dark area within the highlands of that part of the Moon. And, one of the darkest mare regions that we have seen on the Moon. It's comparable, at least in the photographs, to that of Tsiolkovsky. Normally, of course, we think of the dark mare as being the younger basalt flows on the Moon, but in our case, of course, young means something on the order of three billion years or older.

APOLLO 17 MISSION COMMENTARY 12/10/72 CST 14:58 GET 90:05 MC335/3

CAPCOM

Roger.

SC

For our interp -- if we can extrapolate from the samples returned by other missions. It's amazing how far over -- you know the highlands to the west of Procellarum are still are bright, and the contrast between fresh craters and the normal highlands are very obvious still in Earth light. Particularly, along the zero phase point with respect to the Earth.

SC

Rima Gamma now is coming a little bit closer to our oval track in the horseshoe in the larger and more western end of it; the dark horseshoe is quite clear in this light. It's a west or northwest pointing horseshoe. As is the complete trend of that strange feature. I think Ron is going to have an excellent change to study these light-colored swirls within the mare and other parts of the Moon. We had some good views of them and Mare Marginus --

END OF TAPE

SC very marginous and to the east of Mare Crisium, if there is anything to be seen, he should be able to see it during the next few days.

CAPCOM Rog Jack.

SC Say, Gordo, something I just noticed here in working with the GDCs we're having, I looked at the PC gage and at a PD, PC position, why there is a continuous bias on it now of about, oh, 7 percent and if I switch to ALPHA it goes to zero. We never saw that bias before this last burn.

CAPCOM Roger, Gene.

SC Hey, Gordy, I'm looking right up the western edge of the Procellarum Mare where it contacts the western highlands of the Moon and we're just about to fly a little bit south of Grimaldi. That edge is very irregular. There is no obvious indication that it, there are large basins that have been flooded by mare that have formed that edge and but again the topographic distinctions possible in this lighter fall. Now I'm starting to see that there are shadows in the craters.

CAPCOM Roger.

SC That's the small craters. There in the Mare Procellarum closest to Grimaldi there are two arcuate rilles. Look like they are probably V-shaped in their cross section. I'm sure we've seen those on the photograph much better than I can see them here. Those rille patterns though do seem to project over into the Highlands.

CAPCOM Okay.

SC To the north of that, to the north of that Bay of Mare.

SC Just interrupt. Hey, I just saw a flash on the lunar surface.

CAPCOM Ah, I,

SC It was just out there north of Grimaldi. Just north of Grimaldi. You might see if you got anything on your seismometers. Although a small impact probably would give a fair amount of visible light.

CAPCOM Okay, we'll check.

SC It was a bright little flash right out there near that crater. See the crater right at the edge of Grimaldi. Then there is another one north of it. Fairly sharp one north of it. It's where, there was just a thin streak of light.

CAPCOM How about putting an X on the map where you saw it.

SC I keep looking occasionally for --- Yeah, we will. I was planning on looking for those kind of things.

Starting to see the edge of Orientale, Gordy. Way off to the west.

SC Gordy, to the north of Grimaldi there is a large basin that is about the same size but only incompletely filled with a mare in its northeastern quadrant. The rest of it looks like a fairly irregular and hummocky floor material of some kind. But it's almost the same size as Grimaldi. It even looks like it is a little bit deeper. But, of course, Grimaldi has considerable fill. Grimaldi on its eastern edge has some of the grobbens, or it's a rim, if you will, it's cut by three or four anastomosing grobbens. Make it look like some of the ridge areas in the larger basins. Okay, the first ring of Orientale is showing up. The next ring in is extremely obvious, got some very bright east facing slopes.

CAPCOM I'll turn off the innercom.

SC It has some very bright east facing slopes and you can see the bands of Mare that are filling the, both the first bench area and the inner bench. Any time you need us, Gordy, just interrupt me.

CAPCOM Okay, we'll do that.

SC Now, as I look north along the first bench, that's the first bench from the outside, one inside the Cordillerian ring, better check that. I may have my names mixed up. Got a ring caller? Handy? Seat? Should be on there. Yeah, this is what I need. What's the name - they got a name on that - ridge, there? Ah, that's Rook Mountains. Yeah, the Cordillerian. Yeah, that's right and looking just west of the Cordillera in the first bench as I look north in this light which is casting some shadows now Gordy, over in here it looks extremely smooth. Now this is not mare, it's lighter albedo, lighter reflectivity than the mare and, although there are patches of mare here in the lower areas in it. But looking along that plain, in fact a large - long linear plain, it looks quite smooth with only some very broad undulations that appear to be roughly radial to Orientale itself. The closer we get to it the more I see minor relief showing up. I start to see the shadows, I guess. And that relief seems to bring out a hummocky texture in addition to the craters you would expect to see there.

CAPCOM Roger.

SC I won't try to give you a trend on the hummocks because I think the shadows are biasing my view and they do appear to be north south trending but I think that is because of the shadow pattern. This is a spectacular sight you guys, you ought to take a look at Orientale. One of the largest fresh basins on the Moon. It still is probably 4 billion years old, or 3.8 at any rate, if our dating criteria

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are any good. It has the outer cordillerian ring and the inner ring called the Rook Mountains. Very, very nicely shown. They are massive. On that inner ring, the Rook Mountain ring, there are massive complexes much like what we'll be studying at Taurus Littrow. There are low areas non-mare areas that are comparable to the Taurus Valley that we'll be landing in. And all in all I think we'll find that our ring in the Taurus Littrow area around Serenitatis

END OF TAPE

SC Pitatus is comparable in many regards to this Rook Mountain ring around Orientale. You want, - did you interrupt Gordy?

CAPCOM No. I didn't say anything.

SC Okay, I thought I heard your key. Okay, in the inner portion of Orientale, as we approach a terminator, the lighting is still excellent. As a matter of fact, it appears brighter than what we were looking at over at Copernicus. Now, part of that may be, we're seeing much sharper relief since the slow earth-facing slopes are nicely lit, and the backfacing slopes, of course, are in shadow. The first portion of the bench inside the Rook Mountains is partially filled by mare. Now, the higher land in there is very smooth, in a gross sense, it's a very smooth hummocky terrain, cut by roughly circumferential grabens. The trend of the hummock, themselves, are not radial, they're more, well, they're about a 45 degree angle to the radius. They, in detail, have a much finer hackly texture, much like we've been able to see on photographs before. And, in general, you get the impression that, in several areas here, that that hackly textured surface is draped over material that resembles the massifs of the Rook Mountains themselves. There's one area just to the north now of our track, where there's a large, roughly equidimensional, mountain mass, with a few projections of massif-like peaks through this hackly textured surface.

CAPCOM Roger.

SC There are also some radial grabens, I just now picked one up, which we've also seen on the Orientale photographs, taken by Lunar Orbiter. It's amazing how fresh appearing this basin looks, considering it's great age. But it's. it probably is not had any more violent a history than Imbrium. Now, we're getting up, just about to go over a delta rim crater that's out in the basin. I don't remember the name of it off hand. But it should be familiar to some of the geologists who have ampped this basin. It does not appear to have a strong impact ejecta blanket around it. It's filled with mare and it's quitely sharply in contrast to a crater of comparable size to the northwest. See that one Ron. I don't know whether you can get it. I get a good view out of 5 now on that one. And, once again, it looks as if it's hackly textured material that forms the higher hills in the inner bench. It has a draped appearance over the, over pre-existing terrain, and in fact, along the ridges of the hummock, we now can pick up a little rilles that roughly parallel the hummock, although not, not consistently. They do cross down into the valley. But has appearance that there may have been a tensional relief along the crest of each of the hummocks, or many of the hummocks.

CAPCOM Roger.

SC Delta rim crater just as has been, I think discussed in the literature, has just that. Delta rim with no

SC obvious ejecta blanket around it, compared to other larger craters within the basin. We're directly over that crater right now. It's filled with mare, very smooth mare. As a matter of fact, within that fill, I can see no, no craters. Getting very close to the Earth terminator, but you see good texture in the ejecta blanket of the large crater in the north part of the inner basin of Orientale. The radial ridge and valley patterns are very clear, the concentric coarse hummocks near the rim are apparent, and you can even see the second, patterns of secondary, larger secondaries, extending out away, radially out away, from that crater. The south, the mare fill in the south floor of Copernicus, I mean of Orientale, is very smooth, but does have the sea swell texture that we saw over in Tranquillatatis.

SC Better let him say something before AOS.

CAPCOM I ain't got nothing to say.

SC I guess we're getting close to AOS. We're getting close to AOS. Do you have some words for us.

CAPCOM Okay, we show about 9 minutes to LOS. We'd like to clarify one thing, and that was on this tape recorder commands and high and low bit rate. And we just want to make it clear that pre-burn the 6 minute call out is high bit rate, record forward command reset. Did you tell us a few minutes ago that you did indeed do all those at about 6 minutes?

SC Yes, Gordy, I surely thought I did, but I can't specifically, I know the high bit rate was there, because we switched to low later. I can't, I'm afraid I can't specifically verify the command reset.

SC Gordy, I can specifically say that when those, after the BUSS stars came on, we called that out. I'm almost sure Jack did get it, because I had a bunch at the helium valves and the nitrogen, helium and the nitrogen valves.

CAPCOM Okay. We're just trying to make sure if we, to determine if we do have a switch problem, that the INCO did sound low bit rate command just prior to LOS there, before LOI, which is the way it's called out in the flight plan. And then you should have come along later and with a command reset, setting the switch to high bit rate, and the command reset switched into high bit rate MOV, and for some reason it did not go into high bit rate.

SC Well, you want to test it out here, before we go around?

CAPCOM That's a pretty good thought. I think we will. On standby, we'll give you, we'll figure out how we're going to do it here.

CAPCOM Okay, Jack. We just now commanded low bit rate and you're in low bit rate. We'd like you now to select high and command reset.

SC Okay, Gordy, you also have an oscillation in

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SC uplink signal strength and a clicking in the audio. Do you read? We just switched steady at about 60, 70 per cent signal strength.

CAPCOM Roger. We hear that.

SC Okay, I'm going to, you want me to go ahead and command high and command reset?

CAPCOM That's affirmative. The high gain just went wide beam, but we're still reading you loud and clear. Go ahead in high bit rate and command reset.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/10/72 CST 15:28 GET 90:35 338/1

SC High bit rate and command reset.
SC Okay, high bit rate and command reset.
CAPCOM Okay, it seems to have worked properly,
Jack.
SC Okay, Gordie. I may not have got the
command reset at 6 minutes. I just can't tell you right now.
CAPCOM Okay, I want to assure it was no big
problem as far as the frame goes no great loss there.
SC Hope not.
CAPCOM America, Houston about 5 minutes to LOS
now we'd like to have you go ahead and get the jet inhibits and
the covers open as shown in the flight plan so we can see
that before we loose you.
SC Okay, Gordie IR cover is coming open.
Mark it.
CAPCOM Roger.
SC Okay, UV cover is coming open. Mark it.
CAPCOM Roger.
SC And you want me to stay in high bit rate?
CAPCOM That's affirmative you're there you're
going to have to do it in a minute anyway so since you're
there already stay there.
SC Okay, we're there we got tape motion.
CAPCOM Okay.
SC Gordie, the AC BDO has been changed and
you should have the proper check configuration now.
CAPCOM Okay, we see it and it looks good, Geno.
SC Okay.
SC Okay, if you're still with us we're going
to open up the mapping camera laser altimeter cover.
CAPCOM Okay Jack.
SC Okay, we're going to extend the mapping
camera.
CAPCOM Roger on that.
SC Okay - okay mark barber pole.
CAPCOM Roger.
PAO This is Apollo control. We're estimating
a change of shift briefing at 3:45 Houston time, 1 minute
and 16 seconds away from loss of signal on this first lunar
revolution. Participants in the flight director change of
shift briefing will be Jerry Griffin who has been in charge
of the gold flight team, Dr. Royce Hawkins the flight surgeon,
and Charlie Dumis the EECOM. At 90 hours 40 minutes ground
elapsed time this is Apollo control.
PAO This is Apollo control at 90 hours
41 minutes ground elapsed time. We've had loss of signal.

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PAO As the Apollo 17 spacecraft coasted behind the Moon on the first lunar orbit currently in an orbit measuring 52.6 by 168.6 nautical miles. It will be up again in about 47 minutes or approximately. The tables are not up on the display here on the next acquisition of signal as to the next time the spacecraft comes around on the second lunar orbit. Change of shift briefing at 3:45 approximately 10 minutes from now in the small briefing room building 1 news room. Participants flight director Jerry Griffin, flight surgeon Dr. Royce Hawkins and the EECOM Charlie Dumis. At 90 hours 42 minutes ground elapsed time this is Apollo control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/10/72 GET 91:24 CST 16:18 MC339/1

PAO This is Apollo Control at 91 hours 23 minutes. We're 23 seconds away from acquiring Apollo 17 on it's second revolution of the Moon. During this pass, we will send up a DOI 1 pad. That's instructions to the crew for the Descent Orbit Insertion maneuver. We should be acquiring any time now. We'll stand by for the first call.

SC Okay, Houston, we're with you on the OMNI Delta.

CAPCOM Roger, Ron. Read you loud and clear.

SC Okay, Robert. We should have gotten everything right on up to AOS here in the flight plan.

CAPCOM Good show. And the pan camera should be running right now.

SC Okay, it's running.

SC Okay, Houston. America here. Did we stop the orbital photo pad frame 59? And about the substarter point, we took 59 to 66, and frame 67 was taken of the, oh the dark slide on the corner of Lobachevsky.

CAPCOM Roger, America.

SC Those frames that Ron mentioned, this is Jack, that he mentioned, were taken of an area where there's a much lighter gray albedo, rather than the tannish gray, it's pure gray material that generally is on the rim crest of a number of craters. It may be related to the swirls that we see elsewhere.

CAPCOM Roger, Jack.

SC Bob, we're abeam of Al-Biruni, coming up on Goddard and Marginis right now.

CAPCOM Roger, America. We're tracking you on the map here, watching it.

SC Al-Biruni has got a variations in its floor. Variations in albedo. It almost looks like a pattern as if water were flowing on a beach. It's that irregular. Not in great areas, but in small areas, around on the southern side, and the part that looks like it's a water washing pattern is of a much lighter albedo, although I cannot see any real source for it. The texture, however, looks about the same.

CAPCOM Roger, Gene.

SC And to Houston, America. I forgot the (garble). It took a minute and 45 seconds for the mapping camera to extend and a minute and 45 for it to retract.

CAPCOM Roger, Ron. Copy. 1:45 extend and retract.

SC Bob, what's our altitude now?

CAPCOM Looks like you're crossing, you're just about 90 miles, but we'll firm that up here, Gene. You're 90.8.

SC Okay, thank you.

SC Bob, this is Jack, and the question of these irregular swirls that we got in Mare Marginis and we are looking

SC just north of Neper now. I tell you, in the mare, there just is no visible relief. Although there seem to be some similar systematic anyway to the distribution. Like, there'd be a very dark area associate with the light area. And that dark area is darker than the mare. I think the pictures will show that. Now, in the highlands, however, the light albedo areas, which are very comparable, that appear to be swirl like patterns of the same type, seem to be associated with a crest of crater ridges and other high points. We're right over a concentration of these now in the northern part of Marginis, where the rule of the light areas being associated with the either symmetrically around a much darker area than the normal mare, or on one side, and in this case, generally the south side of the dark area, that rule is very clear. And that also seems to hold in the backside, that there was a slightly darker region between areas of light colored swirls.

CAPCOM Roger, Jack. We understand and we're standing by. We have a DOI pad and some other updates.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/10/72 CST 16:27 GET 91:33 MC340/1

SC Okay, we'll go back to work.
CAPCOM America, Houston. We'd like the pan camera
off.
SC You're reading our minds, Bob (garble).
sc It's off.
CAPCOM Roger.
SC It's off.
CAPCOM Pan camera's off, and we'd like ACCEPT. We've
got the DOI target mode to CSM state vector (garble) and an SPS
tail off constant.
SC Okay, you've got ACCEPT, Bob.
CAPCOM Roger, Gene. And, there will be no PIPA
biases.
SC Okay.
SC Bob, I can start with that pad if you wanna.
CAPCOM Roger. We're standing by. I'll start with
DOI 1. Are you ready to copy?
SC Go ahead.
CAPCOM Purpose: DOI 1 SPS GNN 40035 plus 19er0
minus 064 09er3113660. NOUN 81's minus 019er16 all balls for
Delta VY. Delta VZ is plus 00478000228000 00589er plus 00145
019er74 022019er21; Sextant star is 45187519er1. Let me say
trunnion again -- it's 19er1. The rest of the pad is not appli-
cable. Set stars will be Sirius and Rigel. 133200030 4 jet
15 second on the ullage. Other comments, overburden limits
Delta V 17 seventeen feet per second, burn time, 2 seconds. Over.
SC Okay, Bob. Ready for a readback. DOI 1
SPS GNN 40035 plus 190 minus 064 093113660 minus 01916 all zeroes,
plus 00478 all zeroes, 228 all zeroes, 00589er plus 00145, 01974
022 01921 451875 191 rest of pad is NA. Sirius and Rigel, 133200030
4 jets 15 seconds ullage. Overburn limits DELTA V 17 feet per
second, burn time 2 seconds.
CAPCOM Roger, Jack. Good readback. Okay, I've got
a map update for -- at 9338 in the flight plan.
SC Okay, go ahead. I have it.
CAPCOM Okay, Ron. AOS without burn 933137, with
burn is 3424, over.
SC Okay, without 933137, with burn is 3424.
CAPCOM Roger, Ron. I've got a -- you can go back
to block, Ron, and on that same page with the J-3 I've got the
T horizon and TCA.
SC Okay, ready to copy. Go ahead.
CAPCOM Okay. You can go to block in the computer.
T horizon time 934804 TCA minus 20 is 935044. Over.
SC Okay, T horizon 934804 TCA minus 20 is 5044.
CAPCOM Roger, good readback.
CAPCOM Okay, Ron. Over at 9352, 9352, we've got a
different in the NOUN 89 value.

APOLLO 17 MISSION COMMENTARY 12/10/72 CST 16:27 GET 91:33 MC340/2

SC Okay, go ahead.

CAPCOM Okay, the NOUN 89's have changed to the following: NOUN 89, the first one, plus 20.284 plus 15.151 minus 001.9er6, over.

SC Okay, it's plus 20284 and a plus 15.151, and a minus 001.96.

CAPCOM Roger, Ron. And, here's a note for you: The landmark is F Crater located on landing site, picture 404 in the lunar landmark maps. Over.

SC Okay, understand.

CAPCOM Okay, and I've got a TEI minus 5 pad. Over.

SC Okay, go ahead. TEI 5.

CAPCOM Roger, Jack. TEI minus 5. SPS GNN 38570 plus 049er plus 09er2 09er8 39er4324, NOUN 81's plus 2329er8 minus 24031 minus 11528 19er3 09er9er 318. The rest of the pad is all not applicable. Set stars, Sirius and Rigel 133200030. Ullage, 4 jet 12 seconds. Comments: burn undocked assumes a DOI. Over.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/10/72 CST 16:36 GET 91:42 341/1

SC Okay, Bob TEI 5 SPS G&N 38570 plus 049 plus 092 098 39 4324 plus 23298 minus 24031 minus 11528 193 099 318 rest of pad NA Sirius and rigel 133 200 030 all H4 jets for 12 seconds comment 1 burn undock comment 2 assume DOI.

CAPCOM Good read back Jack.

SC Okay, what else can we do for you.

CAPCOM Stand by 1, here. I've got an addition for Ron on that comment about that F crater land mark let me get it straight here and I'll come right up to Ron on it.

SC Okay, I'll stand by.

CAPCOM Ron, this additional comment will have - the crater is 8 nautical miles north of your track. You will lose the land mark at a 36 degree elevation angle, over.

SC Okay, it's 8 miles north and I'll lose it at 30 degrees. Okay so that will be pretty quick.

CAPCOM 36 degrees it's pretty quick still.

SC Is that the one on Family Mountain?

CAPCOM Stand by on that Ron let me look at the book, here, and I'll get frug to help me out on that one.

SC Okay, Houston I've got F crater, now. I'm all squared away thank you.

CAPCOM Okay, Ron. It's right in the middle of that landing site four four which is right before Ignin in the book on the land mark tracking book. And it's right dead center on that page.

SC Okay, I've got it now I wrote down 404 it's 4 of 4.

SC Okay, Houston we've got a good shot of the landing site.

CAPCOM Roger, understand and roger Ron.

SC The shadows, Bob, go all the way across the Scarp and very long pyramiding shadows go all the way past Family Mountain. Looks like the Sculptured Hills are lit up on this side, but I'd almost put the entire North Massif in shadow from where I stand.

CAPCOM America, Houston.

SC Quite an interesting place to land down there.

CAPCOM America, Houston.

SC We can now, I think, see contrast down in the shadow. And the only part of the Scarp that is visible, I think Jack picked it out, as being right where Lara is.

CAPCOM Roger. America, Houston.

SC Roger, go ahead.

CAPCOM Roger. Just some words in your - you'll be going through your systems checklist here and you'll

CAPCOM probably see that it says dump the waste water if it's greater than 85 percent and you are at about 89.6 percent. We'd like you not to dump the waste water until the nominal time in the flight plan. Do not dump the waste water during this systems check. Over.

SC Okay, and I understand that was about 94 hours as I recall.

CAPCOM That's affirmative. That's where the nominal time is and that is where we'd like it dumped.

SC Okay.

SC Bob, that's a fantastic black and white shot of the landing area with the shadow stretching across most of it.

CAPCOM Roger, understand.

SC Bob, I can now see down in through the shadow. I can see Bare Mountain. I can see - I can't really make out the slide yet. Most of the North Massif are still in shadow due to the - due to the Sculptured Hills. And just at the point where we can start really to see through the shadows and see some hummocky terrain on the North Massif. It just went out my next reach. But, I did see some sort of albedo change that went across the canyon about in the vicinity of the scarp.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/10/72 16:45 CST 91:52 GET 342/1

SC Bob, with respect to the landing site, this is Jack, we had near, closer to low phase angle approaching it, when I first had it in view, there was a clear lightening in the area of the light mantle. It was not sharply defined but around the crater Lara and Nansen and to the west of the Scarp there was very clearly slightly brighter reflectivity.

CAPCOM Roger, Jack.

PAO Apollo 17's orbit is 168.8 by 52.5 nautical miles. Present altitude 154.9 nautical miles moving towards apolune.

SC Houston, America, the mapping camera and laser altimeter covers are closed. Now I'm going to label A1, A2, and C2.

CAPCOM Roger, Gene.

SC Yeah, it looks like the old gravity grid at work there or something, I didn't see it get out of attitude at all. Did you all see any movement at all?

CAPCOM Max air was about two tenths, three tenths a degree, Ron.

SC Okay.

SC I'm sorry, Houston. I should have cued you on changing the SPS pressure indicators.

SC You want to see that again?

CAPCOM Standby on that.

CAPCOM Jack, it's not required to go back and do 'em again, we watched it on telemetry.

SC Okay, I'll try to remember to be a little more informative.

CAPCOM No problem, Jack, no problem.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/10/72 GET 92:01 CST 16:54 MC343/1

SC Okay, Houston, there are the torquing angles.
CAPCOM Roger. We see them. They look good.
SC Just for another little matter of interest,
once the Earth is in the field of view, which it's about, looks
like it must be about 12 degrees from Regulus, it's so bright,
that it blacks out any, blanks out the telescope for any star
recognition. However, it worked real good in the sextant. You
can see the star real well. You just have to assume it's Regulus,
though.
CAPCOM Roger. Would that star angle difference...
SC Okay, I'll torque at 30. I torqued at 30,
0930.
CAPCOM Roger. We copy.
SC And the first, the first star angle difference
was, you know, you can get a little bit lax about it. If you want
to spend a little time at it, you can get five balls, looks like.
CAPCOM Roger, Ron. With that star angle difference
on the second one, I can assume it was Regulus. I think you're
safe in your assumption.
SC Oh, yes. Right. He had to do it, or else
I'd have to go down there and do it.
CAPCOM Roger.
PAO This is Apollo Control at 92 hours 11 minutes.
Apollo 17 now at the highest point of it's orbit, 168.8 nautical
miles. 37 minutes remaining before loss of signal on this revolu-
tion.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/10/72 CST 17:05 GET 92:12 344/1

CAPCOM American, Houston, P40 looks good.
SC Okay mighty fine we'll go ahead and
maneuver to attitude then.
CAPCOM Roger.
SC Houston, I think I put the wrong number
in on the pitch. We'll correct it. It's 228 isn't it?
CAPCOM That's affirmative, Gene.
SC Okay, we'll fix that.
PAO This is Apollo control. Apollo 17 is
maneuvering to the proper attitude for descent orbit inser-
tion maneuver. This will put the crew heads down.
CAPCOM America, Houston. We'd like the high
gain to auto.
SC You've got it.
CAPCOM Roger.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/10/72 17:15 CST 92:21 GET 345/1

CAPCOM America, Houston. We'd like you to hold
off switching to OMNIE Charlie till we cue you on that.

SC Wilco.

SC Bob, this is Jack.

CAPCOM Go ahead, Jack.

SC Ah, was there any indication on the
seismometer of an impact about the time I thought I saw a
light flash on the surface?

CAPCOM Standby on 7. We'll check on that Jack.

SC Well, don't worry about it. I thought
somebody was looking at it. It could have been one of the
other light flashes.

CAPCOM Rog. We copied the time and the ---

SC I have a place marked ---

SC Okay, I got it marked on the map too.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/10/72 CST 17:25 GET 92:33 MC346/1

SC Okay, Bob. The stars sextant checks out okay.
CAPCOM Roger, Gene. Good show.
PAO Flight Director, Pete Frank, now checking all
flight control positions for a GO NO-GO on the descent orbit
insertion burn. He's getting a GO from all positions.
CAPCOM America, Houston. You are GO for DOI, and
you can leave the high gain selection. We're holding good.
SC Okay, Robert. DOI. (garble) the high gain.
CAPCOM Gene, say again. You were way down in the
mud on that one. Can you say again, please?
SC Roger, understand. We are GO for DOI, and
you have the high gain.
CAPCOM That's affirmative, Gene. Just --
SC Hey, Bob, I know I'm arguing against this
kind of thing, but you got tenths on that burn time?
CAPCOM It's point one on that.
SC Okay, point one.
CAPCOM Jack, just some words from the back room on
you. The a -- there may have been an impact at the time you
called, but the Moon is still ringing from the SIVB impact, so
it's masked any other -- would mask any other impact, so they may
be able to strip it out at a later time, but right now they don't
see anything at your called time.
SC Just my luck.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/10/72 CST 17:34 GET 92:40 347/1

SC Bob, log us for a picture of the Earth at 92:40 on mag oscar and we're on frame 68.

CAPCOM Roger, Jack, we've got that.

SC You've got a lot of healthy weather out there in the Pacific today. Looks like most of those things we talked about yesterday up in the Hawaii region and also in the south have intensified.

CAPCOM Roger.

CAPCOM America, Houston. We're about 3 minutes till LOS. Everything is looking great no changes are go for DOI. We'll expect to see you at 93:34:24.

SC We'll see you at 93:34:24, Bob.

CAPCOM Roger, Gene.

PAO This is Apollo control at 92 hours 49 minutes. And, we've had loss of signal as Apollo 17 goes behind the Moon. During this pass Jack Schmitt saw a flash just north of the crater Grimaldi at an elapsed time of 90 hours 18 minutes and thought it might be a meteor impact. We could not confirm that; however, the Moon was still ringing from the S-IVB impact and would mask out other activity on seismometer recorders in the science support room here. Apollo 17 will perform the descent orbit insertion maneuver behind the Moon just after the start of the third revolution and at a point near perilune the low point in that revolution. Ignition time for that maneuver is 93 hours 11 minutes 36 seconds. Delta-V change of velocity of 197.4 feet per second. Duration of the burn 22 seconds and we anticipate a result of orbit of 58.9 by 14.5 nautical miles. If the burn is performed as expected we'll next acquire Apollo 17 at 93 hours 34 minutes 24 seconds. If Apollo 17 is unable to perform the burn acquisition time will be 93 hours 31 minutes 37 seconds. We'll come back up just prior to the no burn acquisition time and stand by through that period of several minutes. At 92 hours 51 minutes this is mission control Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/10/72 CST 18:24 GET 93:30 MC348/1

PAO This is Apollo Control at 93 hours 30 minutes. We're a minute and a half away from acquisition without a burn, 4 minutes 10 seconds away from acquisition given a nominal descent orbital insertion burn. Acquisition between those two times would indicate a partial burn of some kind. We'll leave the line up now --

PAO We've passed the no-burn AOS time and do not have a signal. That's an encouraging sign that we did perform a maneuver.

PAO One minute to nominal AOS.

PAO We have a signal, right on the money.

SC Hello, Houston, America.

CAPCOM America, Houston. Go ahead.

SC Okay, and the burn was good on all counts.

22-second burn. It was on time, BGX 19er82, roll after the burn 357 225 and 003. Residuals were plus 0 plus point 2 and plus point 1. Delta VC is 0.1, and that was with Delta V total set into the MS. Should have been -- should have been zero and the residual on the MS was plus 0.1. Oxidizers 305, and fuel is 311 and unbalance 150 decreased. We're in a 59.1 by 14.9.

CAPCOM Okay, America, sounds great.

SC It looks pretty great.

SC We're getting back down among us where us

plain folks belong.

CAPCOM Roger.

PAO Those orbital numbers are an on-board readout. We'll confirm those in a few minutes after some tracking.

END OF TAPE

SC Houston, this is the LMP. There seems to be two general kinds of ray patterns. Those associated with a lot of secondaries and light colored and those that have no visible secondary. And that's independent, yet, from the irregular light colored areas we've been calling swirls.

CAPCOM Roger, Jack. We're copying.

SC Houston, there's also a lot more, there is a lot more of that light colored swirl like irregular material, or discoloration, or whatever you want to call it, in the back-side highlands, particularly as we approach Marginis than I had previously gathered from the available photography.

CAPCOM Roger, Jack.

SC And there still seems to be no relief associated with it. Although, in many cases, it seems to follow ridge lines, or crater rims partway, in other cases, it's quite irregular in its distribution.

CAPCOM Okay.

SC And Bank A, that time, with the chamber pressure was up to 95.

CAPCOM Roger, Ron. And we got tracking data on you. It has a 13.1 perigee, perilune rather.

SC Okay, that's great Bob, and we're still looking at that Zero bias on the DC meter of about 5 to 7 PSI.

CAPCOM Roger.

SC Some of the boys might be interested to know that in a place where the Sun is just grazing the slope, it's a steep slope on the north rim of Crisium, I can see the horizontal lineaments that were such a controversy on 15.

CAPCOM Roger. Understand. The north rim of Crisium?

SC Rog. There are some very steep slopes that just got grazing Sun on them, and with the binocs, you can see that horizontal lineation pattern.

CAPCOM Roger.

END OF TAPE

SC Okay, (garble) T horizon will be good.
Yes. Okay, I've got the edge of Crisium now. (Garble).
SC I'm getting hills on the side of Crisium.
Sure a lot smoother looking material than I thought it would be.
CAPCOM Ron, your about 1 minute from T horizon.
SC Okay, Bob, thank you.
CAPCOM And, Ron we're copying you at a VOX
we believe. Is that affirm?
SC Yes, that's right.
CAPCOM Roger.
SC You're not supposed to copy the other guys
though. Are you copying the other guys?
CAPCOM No, just you Ron.
SC Okay. I may have been talking loud.
CAPCOM Okay, Ron, you should be at T horizon.
SC Mark T horizon. Okay, that's pointing
at the horizon alright I don't see the crater yet.
SC Okay. Okay, I can see the rims of
Macrobius A and B. Okay. Okay, I really don't see it yet.
I can see Macrobius A and B real well. Okay, I'm going to
pick out one and start marking on it. 1, 2, 3, 4, 5, 6, 7
8 that's the wrong one. Okay, now I see what I'm suppose to
mark on, okay. 1, 2, 3, 4, 5, 6, 7, 8, 9, ... 12, 13, 14, 15,
16, 17, 18, 19, 20, 21, 22, 23, and it's gone, okay. No,
the ones that I just wrote under, right. Okay. And now
I'm going to take a look and see if he looks like a cendergon.
Hey, there's Miraldi gamma the mound sticking up there right
beside Miraldi. Hey you guys are going to have some good
hills to run down in there. Can you see it all coming up.
SC That crazy radar is going to be in the
way ... the LM (laughter). Okay it's going through the landing
site now. The shadow is just up to - you can really see the
scarp on there.
SC See what they mean by Sculptured Hills,
Gene? See the knobie characteristics in that area?
SC That's a Massif there too. Now, we're
just over the rim of Serenitatis looking over the Grobim
Plains.
SC Yes, I can just see I'm going to switch
to 171. 3, 4, 5, 6 - just got 6 of them on 171 and then the
other three were were on F crater. 171 was just barely in
the Sherlock was just barely beyond the shadow.
SC This is all supposedly covered with the
dark mantle, Gene what your seeing down there.
SC The sun angles are so that you can't
tell the difference.

SC And look at those mare ridges, though.
I'd say that's looking out into (Garble) down in there. I
think so. I think we're just about ready to climb.

SC I think the terminator is giving you the
feeling of that maybe.

SC Ain't nothing out there.

CAPCOM Jack, Houston. Can you see any albedo
difference in the landing site area between the dark massif
and the light area.

SC We can't see any difference between - in
the low areas between the dark mantle and other materials
right now. We're right at the terminator. Yes, but, Jack
and I weren't really looking at the landing site. I think
Ron was.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/10/72 18:48 CST 93:55 GET 351/1

SC Gerry, you could really see a difference between the South Massif and the mantle material around through there. The mantle is not nearly as dark as it looks on the pictures though. But the Massif, South Massif, especially looked almost a whitish color. I guess it's because the, partly the sun's shining on it. But then - -

CAPCOM Could you see anything that looks like the slide?

SC Oh, yeah, you can see the slide on the thing, definitely see the scarp going across through there. I was primarily concentrating on looking for the various craters so, I didn't spend that much time, you know concentrating on the, how the thing looked. But, in the marks on the thing, the first 4 or 5 marks were on F crater and then I saw Sherlock about half way through it and I got about 5 marks on the Sherlock for 17-1.

CAPCOM Rog, Gene.

SC Houston, in crossing Crissium and Marginis it looked fairly clear that with the small fresh craters, and I don't have a good size estimate right now, I think I'm looking in terms of 100 or 2 meters, you can distinguish where blocks have been thrown up by them and are not possibly giving depth of the local regolith, from the pictures you'll get in there.

CAPCOM Rog, Jack.

SC And also on that lineation question, not only, where the sun grazes a slope do you see the horizontal lineations but they're at the southern end of the shadowed area on a slope, you get a couple other lineations showing up at least in a couple places I saw. one would be parallel to the slope, that is cross contour and the other was at an angle to that direction, oh, say about 30 degrees.

CAPCOM Roger, Jack. We're copying you loud and clear and no problems with com at all.

SC Okay, we just had sunset. And Houston, America, on Mag Bravo, Bravo, 75 to 70 percent were utilized on J3, and F crater and 17 1 through the sextant.

CAPCOM Roger. Just want to confirm, Ron, you started on J3 and then you went to F crater and then

SC Yeah, I went to F crater and then back to Sherlock, or 17 1.

CAPCOM Roger.

SC Actually on J3 I took 4 marks on a crater that was to the west of J3 and then I finally saw J3 and started marking on it.

CAPCOM Roger, Ron.

APOLLO 17 MISSION COMMENTARY 12/10/72 18:48 CST 93:55 GET 351/2

SC Okay, Houston, Mag Oscar Oscar has 85.

CAPCOM Roger, done, thank you.

SC And, then, okay, and there's a number of pictures. Now just a minute let me try to give you a general feeling for where they were taken. Standby one.

SC Okay, a number of the last pictures that were taken on that series, or that rev were taken between say about 1 15 east and, oh, about 100 east and they show several examples of the light colored or swirl alterations to the surface. And that's in Highland country where that is a distinct gray against the tan-gray or tan Highland back ground, general Highland color.

CAPCOM Okay, Jack. I got that.

SC And all my pictures Jesus --- (laughs)

CAPCOM Ron, Houston, we'd like you to move up and do the waste water dump starting now and the O2 fuel cell purge.

SC Okay, we'll get to that and Mag Quebec Quebec is on frame 50.

CAPCOM Roger, copy.

SC Okay, you want to dump the waste water on the front side?

CAPCOM That's affirm, Ron. We'd like to get a third dump now so we have it dumped prior of the camera pass.

SC Oh, okay.

CAPCOM We want to get a dump prior to the UV work there, Ron.

SC Okay, that's right, I'm sorry I forgot about that.

SC Battery vent to - battery vented, battery vented closed and going to dump A.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/10/72 GET 94:03 CST 18:56 MC352/1

SC Pan camera power going off.
SC Okay, Houston, beginning the fuel cell purge
02.
CAPCOM Roger, Jack.
SC Bob, any objections to making that V49 maneuver
now?
CAPCOM Stand by on that, Gene.
SC Okay.
CAPCOM America, no objection to going to V49 maneuver
at any time, just do not ope the UV door until the 94:45 flight
plan time.
SC Okay. We're with you.
PAO This is Apollo Control at 94 hours 8 minutes.
Apollo 17 now is maneuvering to the attitude from which the ultra-
violet spectrometer and the infrared scanning radiometer experi-
ments will be performed. The start of those experiments on this
pass will be after LOS, behind the Moon.
SC Hey, Gordo. I think we're still in LM pres-
sure up there in the tunnel. We'll have to go back to LM/CM
Delta P.
CAPCOM Okay, Gordo's off. I'll have wait a minute
here Gene.
SC For a Sunday night, you're hard to get along
with.
CAPCOM Oh, come on.
SC Wise Marines end up in Antartica.
CAPCOM Roger. Can't do that. They don't have any
gates down there.
SC That sounds like a job you could probably
handle. Listen, after that answer, I'll build one down there
for you.
CAPCOM Thank you, sir. Hey, you can go to LM/CM
Delta P.
SC Okay, thank you.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/10/72 GET 94:12 CST 19:06 MC353/1

CAPCOM America, Houston. The fuel cell 3 purge can be terminated.

SC I beat you.

PAO This is Apollo Control at 94 hours 15 minutes. Apollo 17 is just south of the Oceans of Storm, Ocean of Storms now. Shortly, we'll be coming up on the crater Grimaldi again. That's where Jack Schmitt saw a flash on the last pass. We're showing an orbit of 58.9 by 14.3 nautical miles at the present altitude of 28.1 nautical miles.

SC Hey, Bob, who are you talking us with, Honey-suckle or Goldstone? Honeysuckle, I guess.

CAPCOM We're talking through Goldstone, Gene.

SC Okay, looks like about a toss-up from here. I'll tell you, there is really one heck of a big low pressure area developing somewhere off the coast of California, Washington, and Canada, out in the Pacific Northwest part of the country.

CAPCOM Roger. We copy.

SC We were watching it earlier today, but I tell you now, it's really carrying in some other clouds with it. It must cover an enormous distance and it's got some real spectacular circulation.

CAPCOM Just for curiosity, are you using a monocular on that?

SC No, I'm using a binocular.

CAPCOM Roger.

SC Bob, it's, it's got a trailing front. I can't really see the states, or even North American continent, because...

CAPCOM Stand by, Jack, Gene.

CAPCOM We'd like pretty well

SC Okay.

CAPCOM Sorry about that. Go ahead.

SC Okay, I was just going to say, it's got a, looks like a tremendous trailing front. Roughly, north northwest, south, southeast, and it looks like it may just sweep up the western coast. It's hard to tell how far off the actual center rotation, or even a front is. I just remember from earlier this morning, when I could see land masses, that it appeared to me to be off the Pacific Northwest out in the ocean.

CAPCOM Roger.

END OF TAPE

CAPCOM Jack, Houston here. And, we've just been kicking around with frug, and if you get -- if you want to, during your -- any of your free time, if you have any, you might look at Copernicus with your binoculars and see if the dike goes all the way across. He would recommend using the binoculars. Don't take any of your eat or sleep time at all, but you might get a chance on this one eat pass to as you go by there.

SC Okay. I'll give her a try. You might give me a couple minutes warning the next time around.

CAPCOM Okay, Jack.

SC I'm not sure the attitude is too good for that. I wish I'd thought of it this round.

CAPCOM Uh, Rog. Well, we were pretty busy coming up on it this time. I think the at -- that's why we mentioned that the attitude may be okay during the eat period. We don't want you to break away from the eat period unless you see you can spare some time.

SC Just looking at the southern edge of Grimaldi, Bob, and we probably have it covered on photos, but there's a nice tangential to slightly circumferential graben along the southern wall and climbs out over the western rim and off the eastern rim, and that graben is pre-mare, pre-mare.

CAPCOM Okay, I copy on that, Jack, and as long as we're talking about Grimaldi, you might just rem - we'd like to have you brief Ron exactly the location of that flash you saw. We'll probably ask him to take a picture of it, maybe during one of his solo periods.

SC Hey, Bob, before we get awfully involved, just let me tell you what our motive is here in the next couple of hours. That's to eat and get done what's in the flight plan, and come our rest period, we're probably going to turn out the lights so make sure everything's done by then so we can start it on time tonight.

CAPCOM Yeah, that's a definite -- we concur with that definitely, Gene. Don't want you to work into your sleep period.

SC Okay.

CAPCOM Gene, Houston.

SC Go ahead.

CAPCOM Gene, last night you didn't use a tone booster, and the word you gave us was that it had -- it wasn't working, and we're just wondering if you want -- we're thinking about working up a test board to see if -- did you test it out thoroughly to make sure it wasn't working, or was that just your desire not to use it?

SC We tried it, Bob, and it did not work. The only reason I'm reluctant on a test is that I just don't want it to take much time.

CAPCOM I don't think it would take much time. The only thing I could say is it would -- you know, two obvious things I'm

sure you checked them, Gene, would be the utility power and make sure you had the right lamp tests on when you tried it, and that's the only -- I'm sure you did it, and that's the only obvious thing -- maybe a circuit breaker or something like that.

SC Well, we checked it both on the left side and on the right side with two separate utility powers and verified that the master alarm came on with the test on both sides, and nothing ever happened.

CAPCOM Rog, I was sure of that, Gene. Just wanted to make it clear and put everybody at ease that it's just not working. That was essentially the test. Just forget anything we said about tests.

SC Okay. What test?

CAPCOM Rog. Got you guys trained up there, finally.

SC Arf, arf.

SC Houston, America.

CAPCOM Rog, go ahead, Ron.

SC If I ever find my scissors here one of these days, I think it takes about 4 bolts on either side of the -- you know the optics, where they stow the optics? It looks like there are four little 2-lead bolts that'll come out. And, I think maybe they might be back behind there, I don't know. See, there's a great big slot up at the top of that, oh, it's at least an inch, inch between the top of the optics thing and the top of the spacecraft. I looked back in there with a flashlight and can't see anything, but it's a big hole back there anyhow.

SC I think the Commander might have something to say.

SC Hey, Bob, just ignore everything he said. We'll leave him a pair of our scissors, and he's just worried about being hungry.

CAPCOM Roger. Those are your EVA scissors, too, aren't they?

SC But, he is not -- yeah, but we can handle -- we can handle it with one down there. He is not taking the spacecraft apart to find his scissors, and I will not let him go hungry.

CAPCOM Roger.

SC Okay.

END OF TAPE

SC Okay, get awake.
SC Hey, Bob, before we loose you, how did
the Oilers do today? (laughs)
CAPCOM 9 to 3. Steelers over the Oilers.
SC 9 to 3?
CAPCOM That's affirmed.
SC 9? 09 to 03?
CAPCOM That's affirmative.
CAPCOM Played one of their better games I guess.
SC How about the Chicago Bears? Have you
got that score handy?
CAPCOM Hey, Jack, how about if we pick you up
during the eat period, while you're eating, we'll brief you
of the whole NFL situation for today? Okay?
SC Well, we are eating. I guess we wait
till we come around next time.
CAPCOM Oh, I, the Bears were, the Bears were
loosing.
SC Bob, we'll wait and you can get up the
late evening news prepared for us here the next time we come
around.
CAPCOM Okay. Have your gourmet dinner and I'll
give you the news.
SC Okay.
CAPCOM America, Houston. We're going to loose
you here in about 2 and one-half minutes. We'll see you at
95:28 according to flight plan and you're looking good we
don't have anything, any anomalies or anything against you
right now. You're looking great.
SC Thank you, Robert, we'll see you coming
around the horn.
CAPCOM Roger.
SC Hey, Bob, if you could, it might be
appreciated with a word or two from our home front.
CAPCOM Yeah.
SC Didn't let me do it. I was going to give
'em all a call while on this LOS here. It's that thing again.
I bet you were concentrating on the dot.
CAPCOM Hey, guys, the Bears 21 to 12 over Phila-
delphia.
SC Thank you. We're going to watch your
signal get cut off here.
CAPCOM Roger. Was touch and go on that cause
at one time they're loosing that game.
SC They won, Pete.
PAO This is Apollo Control at 94 hours
41 minutes. We've had lost signal on the 3rd revolution.
Ron Evans performed some land mark tracking on the front side

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of the Moon during this pass and we got some earth weather reports from lunar orbit, believed to be a first, in the Apollo series. And spacecraft is in the attitude now to perform the ultra-violet spectrometer and the infrared scanning radiometer experiments. We would expect to acquire Apollo 17 next at 95 hours 28 minutes. Will come back up then, at 94 hours 42 minutes this is Mission Control, Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/10/72 GET 95:27 CST 20:21 MC356/1

PAO This is Apollo Control at 95 hours 27 minutes. We should be acquiring Apollo 17 on it's fourth revolution of the Moon in about 45 seconds. We'll stand by for the first words. We have a signal and are receiving data.

SC Hello Houston, America.

CAPCOM Hello America. Reading you loud and clear.

SC Bob, the flight plan is complete to 95:30.

CAPCOM Roger.

SC And Bob, the IR cover came open about 1 minute late.

CAPCOM Okay. Understand. Might be interested. The lasted tracking data has you at about 14.1 perilune. It's coming up closer to your CMC data. And, America, we'd like to have the H2 tank, H2 tank 1, fans off. We'll be letting that pressure decay on that. We'll be bringing them back on prior to sleep period.

sc Okay, that's off.

CAPCOM I've got a number of pads and flight plan update any time you're ready for them, if you want or you can hold off it awhile.

SC Why don't you start with flight plan update, Bob?

CAPCOM Okay. At 97:30, you should have a pen and ink change there that says UV cover closed. After that add UV off.

SC Okay, got it.

CAPCOM Okay, now, just a note, or you can jump way ahead to 106:51, where it says delete, see where it says UV off, just delete that, or else make a verified, because it will be off during that whole period.

SC 106. Yes, I'll just put a verified by that. 106:51.

CAPCOM Roger. The next thing I've got are the pads. The TEI 12 and TEI 19 pad.

SC Okay, go ahead.

CAPCOM The first one is TEI 12, SPS G&N 38570 plus 049 plus 092, NOUN 33 times 111544286 plus 25438 minus 17656 minus 07950. Roll is 186109 328. The rest of the pad is not applicable. Great, great, Jack, we'd like an ACCEPT on the computer please.

SC You got it.

CAPCOM Okay. The descent stars are as always, Sirius and Rigel, 133200030. 4 Jet 12 second on the ullage. Three notes: Burn undocked, assumes no CIRC, longitude of the Moon at TIG will be minus 140.19 degrees. Over.

SC Bob, give me note two again please.

CAPCOM Okay, Jack, the three comments are: assumes burn undocked, assumes no CIRC burn and the Moon at TIG, the longitude will be minus 140.19 degrees. Over.

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CAPCOM Okay, go ahead.

SC TEI 19, SPS G&N 380 23 plus 049 plus 086 the tape time 125 46 4722 plus 24563 minus 19253 minus 07313 186 108 325 rest of the pad is not applicable. All the notes are the same as on the TEI-12 pad except the longitude is minus 147.62. Over.

SC Standby one.

SC Okay, here's your readback. TEI 19, SPS G&N 380 23 plus 049 plus 086 125 46 4722 plus 24563 minus 19253 minus 07313 186 108 325 rest of the pad is in A and the remarks are the same as for TEI-12 and that includes set stars and the only change in the 3 which is the lunar longitude at TIG of a minus 147.62. Over.

CAPCOM That's a good readback, Jack. I've got a LM dap readup for you. They recommend this be copied on page 1 of the LM data card books, Jack.

SC Well, strangely enough the LM data card book's in the LM. We'll put it in our activation book. Let me find the right page.

CAPCOM Okay.

SC Let me find the right page.

CAPCOM Roger.

CAPCOM And Jack, the computer's yours.

SC Go ahead, Bob.

CAPCOM Okay, LM dap information. LM weight 36714, CSM weight 38078.

SC Okay, the dap load is LM weight 36714, CSM weight 38078.

CAPCOM Roger, Jack, and I'd like to correct one call on my, the TEI pad. There is one other difference between the TEI 19 and the TEI-12 under notes. And the TEI-19 assumes the circ burn, over.

SC Okay, that's corrected to assume circ on the TEI-19.

CAPCOM Roger, Jack. I'm sorry on that. I've got some notes from the flight ---

SC That's alright, Bob.

CAPCOM Got some notes for Gene from the Flight Surgeon. He promised an update to you on some meal recommendations here on food. You might want to copy this into a supplement.

SC Okay. Just standby one, please.

CAPCOM Roger.

SC Bob, let us take a look at the landing area and will be right back with you.

CAPCOM Okay. Just whenever you want it, there's no hurry on this at all. Jack, you just might put a little note there somewhere for yourself that Copernicus is at 96.03 if you want to look at it.

SC Okay. 96.03.

END OF TAPE

PAO Apollo 17 is coming up over the Taurus Littrow landing site now.

SC Now we're getting some clear - looks like pretty clear high water marks on the -

SC There is high water marks all over the place there.

SC - on the north part of Tranquillitatis in here mare onto the highlands.

CAPCOM Roger.

SC Yes, there is high water marks all over that mare - I think that's Miraldi there. Are you sure we're at 15 miles up?

CAPCOM Your at 14.1 to be exact, Ron.

SC (laughter) looks pretty low.

SC Gee I wonder what it feels like to be at 8 to 10.

CAPCOM You're going to find out I think.

SC I tell you there's some mare ridge or scarps very senuous just passing one, but not only cross the low plainer areas but go right up the side of a crater in one place and a hill in another. And it's not at all like a false scarp. It's looks very much like a constructional ridge. And it has the senuosity of - pardon the expression rattle snake.

CAPCOM Roger. Does it look like that one we saw on the track the other day.

SC Yes, very much like that one that you almost caught. There are tons of pressure - several of them grabens in here. We must be out on the edge of Serenitatis now, right?

CAPCOM Yes, we show you on the edge of Serenitatis, Jack.

SC Rog, I just - we didn't get a view of the site, though, going over this time. I think it was off to the north of us just a tad. That's the best example of a mare like ridge that was as clearly constructional as I would want to see it. Out on the mare it's never quite that obvious. But there it climbed up over a hill and then back down again.

CAPCOM Roger.

SC And, that was just east of the - an area just east of the edge of Serenitatis and probably a little bit south of the landing site.

SC Say, Bob rather than copy specific recommended changes or deletions to a diet can you have a general comment that's any different than what I already understand.

CAPCOM Right it's no problem.

SC If not I would rather delay it.

CAPCOM It's no problem, Gene. Two quick comments, the next couple of days delete the peach ambrosia and the mixed fruit bar. And don't delete anything from the LM menu. And make sure you get all the water in for rehydration and take, bias it if you think you get 30 percent gas then put in 30 percent more so you get all the water that required. And take two antigas tablets after each meal instead of one. That sums it up.

SC Okay, very good I'll handle all those words according to their needs.

CAPCOM Roger.

SC Appreciate them, though.

SC Houston, America.

CAPCOM Go ahead.

SC We shooting magazine QQ frame 50, frame 50, 51 and 52. We're taking - looking south at the terminator.

CAPCOM Ron, we need to get looking at the pan camera per the flight plan.

SC Thank you.

SC Okay, Bob, power on the pan camera now. Mark it.

CAPCOM Roger, got it.

SC Okay, and is my biomed been looking alright?

CAPCOM That's affirmative.

SC Okay.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/10/72 CST 20:48 GET 95:54 MC359/1

CAPCOM America, you can turn the pan camera off.
SC Okay, pan camera going off. Mark.
SC Got the uplink.
SC Okay, Bob. Let's see. Will Copernicus --
will be north of our track. Is that correct?
CAPCOM I believe so from my charts here, but let
me double check that. That is affirmative. Tommy just gave me
the up on that one.
CAPCOM If you guys got time to listen, I can update
you on the homefront while you're looking out the windows.

END OF TAPE

SC Go ahead, Bob.

CAPCOM Let's see. For the CDR, they're eating beans and cornbread over at Nassau Bay tonight. Probably a good thing they're eating beans there, Gene, because you're feeding twenty-five tonight. And, the horse is getting fed, also.

SC Beans and cornbread? It's a good thing I'm eating up here.

CAPCOM You better believe it. And, of course, everybody sends their love. And, over in El Lago, they're, well -- Go ahead, Gene.

SC I was just going to ask you to return mine for me, would you?

CAPCOM Oh, you better believe it. They're listening to the squawk box. You don't have to say anything to me. And, over in El Lago, Jamie is saying her prayers ending them with "God bless America and Challenger" from now on. And, John is saying, "There's Daddy's rocket makes it go pitch light out." Of course, everybody sends their love --

SC They're great.

CAPCOM And, they're all listening right now if you'd --

SC Tell John, though, that I shaved the other night.

CAPCOM Roger. He'll be listening, hearing that. They're all over at the -- in Nassau Bay at a big meeting of the flight plan. Where the Parkers are briefing the Cernans and the Evans on the flight plan tonight. And, out in Tucson, for the LMP, it's kind of cloudy and cold out there today. It's colder than normal. Everything's working fine on the speaker out there, Jack, and they're just listening, and Mother -- your Mother is really tickled and just pleased as all get out.

SC That sounds like Mother. And, I just got a real good view of Copernicus, but I'm afraid I can't help you out on that structure in the central peak. Just a little too dark.

CAPCOM Okay.

SC But, it's a fantastic sight at this altitude. There's a big crater. It looks like it's about 80 kilometers in diameter.

CAPCOM I'll drink to that.

SC And, put down a verify on those dark deposits in the wall. And, also on the southeast wall, there's one right on the rim. I think we mapped that one, too, but I'll have to go back and check.

CAPCOM Okay.

SC That one looked like it had a crater in it. However, they all tend to be elongate radially with respect with the crater. But, that's about all I can add now.

CAPCOM Okay.

SC Bob, I'm glad the squawk box is fixed, and, of course, send my love and best wishes out there to Tucson.

CAPCOM That's a roger, Jack. You guys might also be interested here in the Houston area. All of the ground voice -- or air-to-ground is being carried on FM station -- 100 percent of it -- and KUHT, the television station, will cover the -- educational TV station is going to cover 100 percent of the EVA's, all three of them for all the time.

SC That sounds great. We hope we can provide them with as much education as we can entertainment.

CAPCOM We're counting on it.

SC I guess Parker's all we have left down there to brief them on the landing site, huh?

CAPCOM I won't even comment on that one. (Laughter)

SC Okay. I figure he will later.

SC I'd like, also, to send my best up north to the Bell -- the Bellwood area up there, because I think there's a squawk box up there, too.

CAPCOM Beautiful.

SC And, Bob, it's -- all in all, it's been a pretty exciting day. I think a pretty accomplishing day, and certainly a rewarding day on our part. It's also been a long day, but we're hoping that it can only be superceded by tomorrow and judging from what we've got in store, it might very well be.

CAPCOM I think that sums up the day. It's a day of anticipation for what's going to happen tomorrow. Everything's gone off real well here, and we're just glad you're in the overture end and ready for tomorrow.

SC My goodness, Bob. This is Jack. It's awful hard to spend much time up here anticipating. The events come so fast and, certainly, are exciting and rewarding, each one, one at a time. But, obviously, tomorrow is going to be the biggy.

CAPCOM Roger.

CAPCOM Ron, we're watching your 52 and just be advised you do not have to do the Option 1.

SC Okay. Real fine, Bob.

SC Bob, I'm not sure whether it's entirely proper, being a bachelor, but I'd like to send my regards to everybody -- all the families listening to squawk boxes tonight.

CAPCOM Roger.

SC Bob, we're going right over the Procellarum Ridge now, if I'm not mistaken. Out in the middle of Mare Procellarum, and we're low enough now that you can see some of the terrain.

CAPCOM Okay.

SC That is -- that is, some of the hills, and rilles, and valleys associated with that ridge system.

APOLLO 17 MISSION COMMENTARY 12/10/72 CST 20:55 GET 96:02 MC360/3

CAPCOM Roger. Break, Ron. We've got the 52, and
it looks good. You can torque.
SC Okay, I'll torque it ten three zero.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/10/72 GET 96:11 CST 21:05 MC361/1

PAO This is Apollo Control. Gene Cernan's remark about up north in Bellwood is a reference to his mother, Mrs. Andrew Cernan, who is following the course of the mission at her home in Bellwood, Illinois.

SC Houston, America. You want any memories up -
CAPCOM Roger. We're standing by. We're ready for it.

SC Okay, V74, 6 -.

SC The GDC is aligned and we verified that the LM valve is in LM/CM Delta P.

CAPCOM Roger. We got you.

CAPCOM The E mod is finished, Ron.

SC Okay, thank you.

CAPCOM Ron, we're ready to uplink the Jet monitor program and one of the burn constants.

SC Okay, you have CMC and ACCEPT.

CAPCOM Okay.

SC P20 and ACCEPT.

CAPCOM While you're eating or getting ready to eat, I can update some of the news with you tonight, if you're away from the windows. Are you all still looking out?

SC No. Go ahead, Bob.

CAPCOM Okay, there's not a whole lot of news on the wire tonight, as a matter of fact. President Nixon received a firsthand report on private Viet Nam peace negotiations today from a key member of the US negotiating team, General Alexander Haig, Jr., Henry Kissinger's Chief Lieutenant. Haig flew back from Paris to report to the President, while technical experts from both sides held an unusual Sunday meeting in the French capitol. Presidential Assistant Kissinger will resume his talks with North Viet Nam's Le Duc To on Monday, after a one day recess. And former President Harry Truman continued to show some signs of improvement late today after he was earlier removed from the critical list at Research Hospital up in Kansas City. His cardiac situation has improved and this improvement included a slower and stronger pulse and a stable blood pressure. The football scores are as follows in the National Football League today: the Bears defeated the Eagles 21 to 12, the Detroit Lions and the Buffalo Bills played to a 21-21 stand off, Dolphins extended their undefeated streak 23 to 13 over the New York Giants, the Patriots defeated the New Orleans Saints 17 to 10, Green Bay sewed up the Central Division of the NFC by defeating the Vikings 23 to 7, the Cardinals upset the Rams today 24 to 14, Denver defeated San Diego 38-13, Kansas City upset Baltimore 24 to 10, the

APOLLO 17 MISSION COMMENTARY 12/10/72 GET 96:11 CST 21:05 MC361/2

CAPCOM 49'ers defeated the Falcons 20 to nothing, 20 to 0, and Pittsburg defeated Houston 9 to 3, and they took the Central Division of the AFC. So, the playoff picture is becoming a litte clearer. You've got, in the NFC you've got Washington, Dallas, and Green Bay, and the fourth team will either be San Francisco, Los Angeles, or Atlanta. That will be decided next week. In the AFC Pittsburg, Miami, and Oakland are in it, and the fourth team will be either the Jets and another team. They've got the Giants listed here, but it can't be the Giants, because that's the wrong division. So we'll check that one out. Cleveland, okay, Cleveland. The fourth team is either going to be Cleveland or the Jets. And did you get a spurious as master caution warning.

SC

No, Ron was retesting our bleeper again.

CAPCOM

Okay.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/10/72 CST 21:15 GET 96:20 362/1

SC Ron was retesting our bleeper again.
CAPCOM Okay.
SC And, one of those that worked in lunar orbit, I guess. It doesn't work during coast because it's working now.
CAPCOM Good show.
SC Sounds like there's going to be some good football games coming up.
CAPCOM Yes indeed.
SC Who is playing tomorrow night?
CAPCOM Stand by. That's the Oakland - Oakland and the jets.
SC Okay.
CAPCOM Ron, the uplink is complete. The EMP is running. The computer's yours.
SC Okay, Bob we got it back.
CAPCOM Ron, we would like the H2 tank fans on and that will be the sleep configure. H2 tank 1 fans on, and leave 3 in auto.
SC You want H2 tank 1 - you want 1 and 2 on?
CAPCOM Negative tank 1 on.
SC Okay, that leave us with tank 1 on tank 2 off and tank 3 in auto. Is that what you want?
CAPCOM Roger. You're calling A2 fans that's what we want.
SC Yes, H2 fans Bob I'll say it again. H2 fans 1 is on, 2 is off and 3 is auto.
CAPCOM That's a good configuration, and that will be the sleep configuration.
SC Okay.
SC Hey, Bob it looks like we might make - get to sleep on time tonight, and - well we will make it. And I think it goes without saying we definitely want to get up on time tomorrow.
CAPCOM Rog.
SC I'm going to have the toe booster plugged in, and also I'll make sure the (Garble) power and audio power and all that stuff is on.
CAPCOM Roger.

END OF TAPE

CAPCOM Ron, Houston.

SC Go ahead, Bob.

CAPCOM If Ron's listening, just a word about the mapping camera extend retract times, we came up with slightly different times than what he'd called and we were wondering if his were just ball mark or if he had timed it? In either case the times are a little bit long on extend retract which is a little cause for worry about that mapping camera may fail and later on downstream we may want to change our operating mode on that mapping camera and he might want to time a little closer. If he can get the chances it could come up.

SC Bob, that's a good point on the thing. those weren't quoted exact times and matter of fact we kinda looked away and it was about a ... you know, somewhere about that period. of time. We looked away and when we looked back it was gray again. Next time we extend them I'll get a good accurate indication.

CAPCOM Okay, no problem. We'll believe the strip chart.

CAPCOM We'll take the strip chart data. We've got 1 24, 1 minute 24 seconds for extend and 1 51, 1 minute 51 seconds for retract. And both those are a little bit on the high side.

SC Okay. I would believe the strip chart.

CAPCOM Rog, Ron, you all are about 4 minutes from LOS. Okay, we might loose you a little bit earlier than that.

CAPCOM Okay, we may loose you a little early due to the SIM bay attitude and will pick you up at 97:22.

SC Okay, Bob. Once more around at 97:22.

PAO This is Apollo Control at 96 hours 34 minutes. Apollo 17 has turned the corner a little early, about 50 seconds early. We've lost contact with the antenna because of it's attitude, about 50 seconds early. During this 4th pass on the front side of the Moon there was considerable description of the Lunar surface and photography was accomplished. The mapping camera experts will continue to study the extension and retraction times of the camera. If those times continue to grow, they will probably revise the flight plan somewhat to reduce the number of times that camera must be extended and retracted. At the present time though they are just keeping a close eye on those times to see whether they will continue to grow. We'll next acquire Apollo 17 on it's 5th revolution of the Moon at 97 hours 22 minutes.

END OF TAPE

APOLLO L7 MISSION COMMENTARY 12/10/72 CST 22:15 GET 97:21 364/1

PAO This is Apollo control at 97 hours
21 minutes. We're fifty seconds away from the time Apollo 17
should be within communications range on it's fifth revolution
of the Moon. We'll stand by for the first contact.

PAO We have a signal now.

SC Houston, 17.

CAPCOM 17, Houston, go ahead.

SC Roger, we're just about ready to finish
up here. I have a couple of questions. Do you want us to
cycle cryo fans or just leave them alone now?

CAPCOM We'd like them just left alone, left in
your configuration you are now, Jack.

SC Okay, there will be no cycling then.

CAPCOM Roger, we have one question. Whose got
the duty tonight or will he be wearing a headset.

SC Yes, Ron has the duty he will be wearing
the headset, but I will be on the biomed underneath.

CAPCOM Understand that, and one note for Gene.
It's an addition to that flight surgeons note. When you
rehydrate your food make sure that you go the - let it re-
hydrate for the maximum amount of time. I know you miss it
on this one, but the next - like tomorrow morning make sure
it rehydrates the maximum amount of time.

SC Okay, I'll tell him.

CAPCOM Roger.

SC And we've got the star crater stereo trio.

CAPCOM Roger.

SC And we're mag oscar oscar is on 93 now.

The last three pictures were that trio.

PAO This is Apollo control at 97 hours
28 minutes. We're showing -

SC We're sensing complete on the presleep
checklist. And except for computing agents configuration and
Ron will take care of that.

CAPCOM Roger.

SC And, Bob while we're gradually getting
into configuration here let me reiterate something that I've
been watching this rev as we did a lot of other things. And
that was this relationship of the light colored or light gray
swirl patterns on the surface to patterns associated pattern
parallel patterns that are darker than the average of the
surrounding area. And this is true both in Mare Marginus
and in most cases on the back side.

CAPCOM Roger, Jack, we'll get that to the PIs.

SC Roughly, although their very irregular
patterns roughly it's concentric zoning of dark to light

APOLLO 17 MISSION COMMENTARY 12/10/72 CST 22:15 GET 97:21 364/2

SC within an intermediate albedo surface.
Now there are variations on that theme sometimes you don't
get the symmetry quite as good, but it's common enough that I
think it's worth noting.

CAPCOM Roger.

END OF TAPE

SC Also, there's a sequence, different kinds of crater filling on the far side, and I think that as the orbital stay progresses, we may be able to pin down the relative age relationships and the characteristics of those crater fill - filling episodes. Whether they are single episodes that happen in a variety of craters or they're a function of the age and characteristics of the craters in which you find them is not clear right now, but the - they seem to form fairly distinct groupings of crater fill material.

CAPCOM Roger, Jack.

SC One of those crater fill materials that you also see in other kinds of depressions other than craters is a very smooth light plains forming material and it is although cratered when you see it at the terminator, it is smoother than the Mare. That is, it does not seem to have the swell, the sea swell characteristics or ridges or any other features other than the craters superimposed on it.

CAPCOM Roger. We copy.

PAO Apollo 17's orbit now 59.2 by 13.7 nautical miles. The present altitude's 17.8 nautical miles.

CAPCOM 17, Houston. You can go ahead and close the uv cover. We'd like to hold off one minute before you turn the UV off. We want to look at one minute of data with the cover closed.

SC Oh, okay. Roger. A walk on. I see it now.

SC Okay, it's closed.

CAPCOM Okay, we'll give you a cue when you go UV OFF and Hinkle would like to know what you've got on your high gain pitch and yaw knobs. Not the dials but the knobs.

SC Alright. The knobs are see, about plus 20 and 185.

CAPCOM A pitch of 20 and 185 on the yaw.

SC That's affirmed.

CAPCOM And Jack, you can turn the UV off now.

END OF TAPE

SC Okay, it's off.

SC Okay, I got the landing site. We're right over the top of it, and the Scarp is fantastically detailed at this -- can you see in there, Gene? Right down, right down, straight down there. Okay, well, the light mantle is ob -- very obviously mantling the area. The Scarp was very detailed, and so far, could not see any structure in the Massifs at all, but I haven't had any -- didn't have much time to watch it on that pass. The slide very definitely subdued the general detail in the Plains area -- or the light mantle, if you will, rather than slide. MOCR Crater was finally out of the dark.

CAPCOM Roger.

CAPCOM Jack, we'd like to know if you think you can adjust the high gain as close to plus 15 and yaw 190 as possible?

SC Okay, Bob, that's adjusted plus 15 and 190, and I suspect I was a little closer to 15 than 20 when I called you before.

CAPCOM Roger.

SC I'll tell you, from this altitude and with that low sun, there's no question of the sharpness of the topographic features in the landing area. The Scarp, and even some of the apparent back part -- backflow features, and Parker will know what I'm talking about -- that is apparent flows to the west in the light mantle area were extremely sharp, even those fronts going west were sharp. It looked even more like a mare ridge than it ever did before.

CAPCOM Roger.

SC Okay, Bob, this is Gene. I had a - just a quick view of the site, and if we're anywhere near it, we'll recognize it, I think, without question. And, I think with that, we'll bid farewell, and goodnight.

CAPCOM Okay, gang. And looking for a busy day tomorrow --

SC That's for sure. You'll see him --

CAPCOM Sorry, I cut you out.

SC I said never fear, your CMP is watching.

CAPCOM Roger. And, just a reminder - SMO off tonight -- please?

SC He has the watch tonight.

SC Okay, okay, as soon as I get bedded down, I'll do that.

SC Don't worry, he's got a batch of guys up here reminding him of that one.

SC And, I checked out the little whistle, and it works like a charm.

CAPCOM Roger. I was betting on you guys making that switch last night, and I lost my bet.

SC Just to make sure, I'll check it again.

APOLLO 17 MISSION COMMENTARY 12/10/72 CST 22:32 GET 97:38 MC366/2

SC And, Robert, goodnight to all.

CAPCOM Goodnight up there.

SC And, that is a test. This is a test, test,
test. Goodnight, Babe.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/10/72 GET 97:48 CST 22:41 MC367/1

PAO This is Apollo Control. We said goodnight at 97 hours 47 minutes. We'll leave the line up for a few minutes longer, to see whether there's any further conversation.

PAO This is Apollo Control at 97 hours 53 minutes. Crew has just turned off the voice switch on the spacecraft, indicating they do not intend to talk anymore tonight, and we do not intend to put in anymore calls to them, so we'll take this line down now and come back up with hourly reports, during the sleep period, which has just started.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/10/72 CST 23:45 GET 98:52 MC 368/1

PAO This is Apollo control at 98 hours 52 minutes. Flight Director, Pete Frank and members of the Orange Team, are preparing to hand over flight control duties to Flight Director, Gene Kranz and the White Team at this time. There will be no change of shift news conference. Shortly after the Orange Team came on duty, the descent orbit insertion number 1 maneuver was performed. At 93 hours 11 minutes 36 seconds, this was a very good burn. Duration 22 seconds. Velocity change of 198.2 feet per second. Resultant orbit was 59.1 by 14.9 nautical miles. Apollo 17 crew since that time has been performing landmark tracking through the sextant, a great deal of photography, and performing the ultraviolet spectrometer and infrared scanning radiometer experiments, and providing surface descriptions, the geology reports and some Earth weather reports from lunar orbit. The infrared experiment will be continued throughout the rest period that the crew is now in. The ultraviolet experiment has been terminated for tonight. The mapping camera is taking longer to extend and retract than expected. And the last operation took 1 minute 24 seconds to extend and 1 minute 51 seconds to retract. Each of these operations should be accomplished in 1 minute 12 seconds. The camera experts will continue to watch this and if the delayed operation continues, they may reduce the number of times that the camera is extended and retracted. Crew said goodnight at 97 hours 47 minutes. They're anticipating a big day tomorrow, landing, first EVA. 7 hours 49 minutes remaining in that rest period. Apollo 17's present orbit is 59.1 by 13.5 nautical miles. And a short time ago the flight dynamics officer gave the flight director the latest impact coordinates for the S-IVB which impacted the lunar surface today at 89 hours 39 minutes 40 seconds. Coordinates for that impact; 4.21 degrees south latitude, 12.31 degrees west longitude. At 98 hours 55 minutes this is mission control Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/11/72 GET 99:16 CST 0009 MC 369/1

PAO This is Apollo Control at 99 hours 16 minutes. We are about 1 minute from reacquiring Apollo 17 now in its 6th revolution of the Moon. We said goodnight to the crew on the last revolution at 97 hours 47 minutes and the flight surgeon reported that it appeared Jack and Ron were both dozing off before we lost radio contact with the spacecraft as it went around behind the Moon on the fifth revolution. Here in Mission Control, flight director Gene Kranz has been reviewing the status of the mission with his oncoming team of flight controllers. No problems of note to be reported. The service propulsion system engine, it was reported, looks to be in very good shape as a result of the, or based on the data received during the LOI and DOI, the lunar orbit insertion and descent orbit insertion maneuvers performed earlier. The flight dynamics officer, during this shift, is going to be following the spacecraft trajectory very closely looking for any cross range or down range errors which would need to be compensated for prior to the lunar landing. We don't expect any conversations with the crew. We have had confirmation of acquisition of signal now and we'll stand by for a short period of time to get a look at the systems and to assure that we're not going to get a call from the crew. This is Apollo Control. No sign of any activity from the crew. The flight surgeon reports that Jack Schmitt and Ron Evans, both of whom are wearing their biomedical sensors during the sleep period, appear to be sleeping soundly at this time. Apollo 17 is currently in an orbit 59.1 by 13.5 nautical miles and we have about 52 minutes remaining before the spacecraft again goes behind the Moon and we lose radio contact. We'll come up with a status report shortly prior to loss of signal. At 99 hours 31 minutes this is Apollo Control Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/11/72 CST 01:15 GET 100:22 MC 370/1

PAO This is Apollo Control at 100 hours 22 minutes. Apollo 17 has now gone behind the Moon and before we lost radio contact the Surgeon reported the crew appeared to be sleeping soundly. We have about 6 hours 22 minutes remaining in this sleep period before the crew awakens to a very busy day which will include landing on the Moon for the Lunar Module Crew, Jack Schmitt and Gene Cernan and the first Lunar Surface EVA. Shortly before loosing radio contact Gene Crans checked with each of his flight controllers, got a report that everything was in order, no problems as Apollo 17 went behind the Moon. We'll be reacquiring the spacecraft in its seventh revolution in a little less than 45 minutes. At 100 hours 23 minutes this is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control at 101 hours 10 minutes and we are standing by now to re-establish radio contact with Apollo 17 at the beginning of it's seventh revolution of the Moon. We anticipate the crew will be sleeping soundly as they were when we last had radio contact with the spacecraft some 45 minutes ago. Infact, the 2 crewmen on whom we have biomedical data, Ron Evans and Jack Schmitt, appeared to have gone to sleep almost as soon as they said goodnight. Very shortly thereafter the surgeon noted the slow down in heart rhythms thypical of sleep. And that is the condition they were in when we last saw them at the end of the sixth revolution. And we have reacquired radio contact with Apollo 17 and getting good data from the spacecraft at this time. The crew is scheduled to end this 8 hour rest period in a little over 4 and one half hours from now. And it appears that everything is quiet aboard Apollo 17 and no signs of any crew activity. We will take the lines down and continue to monitor and we'll come up with another status report just prior to loss of signal as the spacecraft goes behind the Moon on this the seventh revolution. This is Apollo Control at 101 hours 12 minutes.

END OF TAPE

PAO This is Apollo Control at 102 hours 16 minutes. The sleep watch going very smoothly and very quietly here at Mission Control. We now have three and one half hours until the scheduled crew awakening time. And we've just loss of signal from Apollo 17, now going behind the Moon on it's seventh revolution. We'll be reacquiring in about 40 minutes. At the present time we show Apollo 17 in an orbit roughly 59 by 13 nautical miles. And it appears that the crew is continuing to get good sound sleep with three and a half hours, as we said, remaining in the sleep period. At 102 hours 18 minutes, this is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control at 103 hours 4 minutes. We're standing by now to re-establish radio contact with Apollo 17 as the spacecraft comes around the eastern rim of the Moon and reappears on the front side in it's eighth revolution of the Moon. The crew now, a little more than 5 hours into their sleep period, about 2 hours 40 minutes remaining before we send them the wakeup call. And all spacecraft systems continue to perform normally. No outstanding problems at this time. We are showing Apollo 17 in an orbit of about 59 by 13 nautical miles, and we should be seeing telemetry data shortly now. Radio from the spacecraft being received at the 210 foot dish antenna at Honeysuckle Creek, Australia, near Canberra. And we're once again receiving data from the spacecraft. We, of course, do not expect any activity from the crew and we'll have the lines down during this front side pass, should there be any unexpected conversations we'll bring up the lines immediately. We'll have about 1 hour and 5 minutes before Apollo 17 disappears around the back side of the Moon on the eighth revolution. This is Apollo Control, Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/11/72 CST 05:03 GET 104:10 MC 374/1

PAO This is Apollo Control at 104 hours 10 minutes. Apollo 17 has just gone behind the Moon now. The spacecraft on it's eighth revolution of the Moon and we'll be reacquiring in about 45 minutes as Apollo 17 comes back around the eastern rim of the Moon on it's ninth revolution. During the ninth revolution we'll be sending the wakeup call to the crew, getting them ready for one of their busiest days on the mission which will include LM separation from the Command Module and the powered descent to the lunar surface followed by the first period of lunar surface exploration in the valley of the Taurus Mountains. The flight surgeon reports the crew has been getting, apparently, a very good nights sleep. They are now six and one half hours into that scheduled 8 hours sleep period with about an hour and one half of sleep remaining. Apollo 17 in an orbit 59 by 13 nautical miles and if every thing goes according to the flight plan undocking will occur about 11:20 Central Standard Time on the twelveth revolution with powered descent to the lunar surface coming at about 1:55 P. M. At 104 hours 12 minutes this is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control at 105 hours 40 minutes. We're about 5 minutes away, now, from putting in a call to the crew getting them up for breakfast and ready to start a day that will culminate with landing on the lunar surface and the first EVA at the Taurus Mountain site, Taurus Littrow, near the Sea of Serenity. CAPCOM, Joe Allen, will be putting in a call to the crew in about four and one half minutes from now and we'll stand by for that wakeup call to the crew of Apollo 17. Here in the control center the landing shift, landing team of flight controllers, is beginning to come on duty, after a very quiet uneventful night monitoring Apollo 17 in lunar orbit. The spacecraft now on it's ninth revolution of the Moon completing the front side pass and we'll be losing contact with the command module as it goes behind the Moon on the ninth revolution in about 22 minutes.

END OF TAPE

CAPCOM (Music) "Good Morning America, How Are You"
CAPCOM Good morning, America, how are you?
SC This is America - that's a good way to wake
up.
CAPCOM Good morning, America, how are you? You'll
be gone a million miles before the mission is done.
SC (laughter) Okay - Houston, America. Are
you reading okay now?
CAPCOM You're loud and clear, Ron, how are we?
SC Okay - mighty fine, Joe. - Let's hear
it again, Joe.
CAPCOM Are you serious?
SC Well, just got on a head set. You never had
a chance to wake me up before.
CAPCOM Stand by, here it comes - It's coming
at you, America.
SC Okay.
CAPCOM (Music) "Good Morning, America, How Are You?"
CAPCOM How about that?
SC Thank you, Joe. That's great - we're moving
on.
CAPCOM Don't you know?
SC .And a big eight wheeler.
CAPCOM And, America, you're 10 minutes from LOS
and the spacecraft looks great.
SC Okay, Joe. That's good to hear. And
we're starting to move now and we'll be ready for you when
we come around.
CAPCOM All righty.
SC How long are you with us this morning?
CAPCOM Oh, not too many more minutes.
SC Hope we didn't keep you up last night.
CAPCOM The pleasure was ours, Jack. We devoted
our eight hours to selecting your wake up call this morning
and got a little help from the News Room pool on the sugges-
tion.
SC Well, that was a good suggestion - I had
forgotten all about that song. That's a good one. Got to
find the "Golden Rocket" for us some morning.
CAPCOM You'll wish you hadn't asked.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/11/72 CST 6:49 GET 105:56 MC 378/1

CAPCOM 17, this is Houston. You'll be pleased to hear that the IR and the SIM bay is returning some beautiful data to us here.

SC Hey, great, Joe. That's good to hear, by gosh.

SC What are you learning, Joe?

CAPCOM Hot spots on the Moon, Jack.

SC Well, we knew we had one going around but we didn't know we had any on it. Houston, let's see if Delta P is 0.4.

CAPCOM Copy that.

SC Where - where is your big anomalies, Joe?
Can you summarize quickly?

CAPCOM Jack, we'll get that for you next pass.

SC Well, don't worry about it. I think we're going to have a lot of things on our mind the next pass. But we're just passing over Orientale again, Joe, and in Earthlight it's probably one of the most spectacular sights in nature.

CAPCOM Copy that, Jack, I can imagine.

SC Joe, can you imagine waking up anywhere else

CAPCOM 17, we'll think about that until you go LOS.

SC Rog.

CAPCOM 17, about 30 seconds to LOS. We'll see you on the other side. It's going to be a good day.

SC Righto Joe.

PAC This is Apollo Control. We've now had loss of signal as Apollo 17 goes behind the Moon on the ninth revolution. We'll be reacquiring in about 45 minutes - a little bit less, as the spacecraft comes back on the front side on the tenth revolution. And by that time the crew should have completed breakfast. They'll be getting the pressure suit unstowed and begin preparations for entering the lunar module, for the separation landing on the lunar surface, and the first EVA all scheduled to occur this day. The IR data which Joe Allen advised the crew we're getting in such good form back here on the ground from the spacecraft's service module, is from the IR scanning radiometer. This is an instrument carried in the CSM SIM bay, scientific instrument module bay. And it's obtaining surface temperatures under the groundtrack of the spacecraft from which scientist will be able to construct a temperature map. From this information they hope to be able to characterize such lunar surface physical parameters as the general conductivity, the bulk density and the specific heat. Apollo 17 at the present time is in an orbit about 59 nautical miles at it's high point and about 12 and a half miles above the lunar surface at the low point. At 106 hours 5 minutes this is Apollo Control Houston.

END OF TAPE

PAO This is Apollo Control at 106 hours 51 minutes. We're about 2 minutes now from reacquiring Apollo 17 as the spacecraft comes back around on the front side of the Moon on the tenth revolution. And when we again establish radio contact the crew should have pretty well finished breakfast and be getting suited up ready for Jack Schmitt and Gene Cernan to enter the lunar module and begin preparations for separation, powered descent to the lunar surface. Here in the control center we're in the process of a shift handover. Flight director, Gerry Griffin, and the team of flight controllers who will be on during today's powered descent are now coming on to replace the Gene Kranz team. Flight director Neil Hutchinson will be in charge of CSM activities once the two vehicles separate. CAPCOM for the lunar module will be Astronaut Gordon Fullerton and Astronaut Ken Mattingly is moving in taking up position at the console to handle CSM activities. And we're now about 30 seconds away from reacquiring Apollo 17.

PAO INCO reports acquisition of signal. We'll stand by for a call to the crew.

SC Okay, Houston, we're with you and we're in the process of getting the tunnel pressurized and moving right towards probe and drogue removal.

CAPCOM Okay, Jack, good morning.

SC Good morning, Gordy. Welcome aboard.

CAPCOM Thank you.

SC I take it you're going to pick up the - the reports - post sleep reports later. Is that correct - from Ron?

CAPCOM Anyway it's convenient for you.

SC Well, we're moving towards getting the suits on unless you want me to take 5 minutes here, we'll leave it alone and let Ron give it to you.

CAPCOM That will be fine.

SC Everybody ate and drank and slept just about like last night.

CAPCOM Okay.

SC Good morning, Gordy.

CAPCOM Good morning, Commander.

SC Tell Joe I'm sorry I didn't get a chance to say hello to him but I did hear his presence being evident.

CAPCOM Okay, we'll pass it along.

SC Houston, America. The tunnel hatch is out.

CAPCOM Okee-doke, Ron.

APOLLO 17 MISSION COMMENTARY 12/11/72 07:43 CST 106:51 GET MC379/2

SC
this morning?
CAPCOM
date.

Gordy, how does America look to you

Beautiful, as it has all the way to

SC

Okay.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/11/72 CST 07:53 GET 107:00 MC-380/1

AMERICA Okay, Houston, America. The old probe is underneath the couch.

CAPCOM Okay.

AMERICA Houston, America.

CAPCOM Go ahead, America.

AMERICA Okay, how are Jack's EKGs, the stuff he's going to take now.

CAPCOM Let me get a check.

AMERICA (Chuckle) wait a minute, he's not plugged in. But you know, he's had them on all night. Were they good?

CAPCOM Stand by.

CAPCOM Yes, Ron. He was plugged in; we had good signals.

AMERICA Okay. Good.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/11/72 CST 7:58 GET 107:05 381/1

CAPCOM Mike, Houston. If someone's near the telemetry switch, if you go to ACCEPT, we'll give you a state vector.

SC Okay, you have ACCEPT.

CAPCOM Okay, and we're supposed to update your trajectory, which is looking good. Predicted perilune at TDI without DOI 2 would be 11.9, a little lower, so that means that DOI 2 will be a little less, in terms of DELTA V than nominal. But otherwise, looking good.

SC Okay, did you say 11.2 for perigee, now - without the DOI 2.

CAPCOM I might have said that, it's 11.9 predicted at PDI time without the DOI 2.

SC Okay, 11.9 predicted without - at PDI time without DOI 2.

CAPCOM That's right.

SC Okay, so DOI 2 will be a little bit less than predicted.

CAPCOM Affirmative.

SC I'm repeating it to these guys that are getting suited here, see.

CAPCOM Okay.

CAPCOM Okay, I have your vector now, you can go back to block.

SC Okay, we'll go to block.

SC Yes.

CAPCOM America, Houston. You owe us a reverification of the docking tunnel index angle.

SC Okay, let me check it.

SC Well, I kept thinking it might move back to zero, but it hasn't moved - plus 1.2.

CAPCOM Okay, plus 1.2. For your information, Ron, on consumables this morning, we're running 6 percent above the flight plan line on RCS. On the hydrogen, we're about 8 percent above the line on tank 2, right on the lines on the other 2 hydrogen tanks. And on the O2, we're running our standard 4 to 5 percent below the line on oxygen tank 1, tank 2 is right on and tank 3 has now gained to about 3 percent above the line. All looking good.

SC Okay, Houston, hey, that's mighty fine.

SC Hello, Houston, America.

CAPCOM Go ahead.

SC Okay, I'll give you the Commanders food from yesterday.

CAPCOM Alright, ready to copy.

SC Four bacon squares, cornflakes, orange beverage, 2 sips of coffee, a vitamin. Okay, meal B - chicken and rice soup, meat balls and sauce, orange PA drink

APOLLO 17 MISSION COMMENTARY 12/11/72 CST 7:58 GET107:05 381/2

SC And caramel stick - 1 caramel stick.
Okay, meal C - potato soup, beef and gravy, citrus beverage,
a chocolate bar and a package of pecans.

CAPCOM Okay, we're with you so far.

SC Okay, Commanders medical log -PRD 17036,
6-1/2 hours of good sleep, 1 seconal last night, 3 bags of
fluid.

CAPCOM Roger.

SC Roger.

SC Three bags of water, I better put it
that way I guess.

END OF THE TAPE

SC Okay, here we go on the LMP's food.
CAPCOM Okay.
SC Okay. Two bacon squares, scrambled eggs,
2 apricots, cocoa and a coffee. Meal B. Fruit cake, citrus
beverage, hamburger and a coffee. Meal C: Lemonade, beef and
gravy, ambrosia, cereal bar and tea. I guess that's it.
CAPCOM Okay.
SC Hey Houston, why don't I give you LMP's
menu this morning too, Day 5?
CAPCOM Okay.
SC Then I won't have to get back in their pages.
Okay, its a sausage patty for LMP, sausage patty, cinammon toasted
bread, instant breakfast, coffee with K, and a grape drink and
a vitamin. Okay for the commander on Day 5: Spiced oat cereal,
sausage patties, instant breakfast and vitamins.
CAPCOM Roger.
SC Okay, for the LMP's medical log: PRD 24108,
7 and 1/4 hours very good, 1 seconal last night, 3 and 1/2 cans
of water.
CAPCOM Roger.
SC Okay, we're ready to go on command module
pilot of the spaceship America and his menu.
CAPCOM Go ahead, captain.
SC Okay. Bacon squares, scrambled eggs, corn
flakes, orange juice, 2 coffees, 3 carmel candies - that's 3
sticks of carmel candy. Meal B: Chicken and rice, meat balls,
butterscotch pudding, orange PA drink. I missed the vitamins up
there in A too. Okay in Meal C: Potato soup, beef and gravy,
chicken stew, orange GF drink, tea, chocolate bar, and a package
of pecans. Okay CMP medical log: PRD 15034, and about 5 and 1/2
of good sleep; a little trouble getting to sleep last night and I
woke up early this morning. I took a seconal, didn't seem to
have much good - much effect, and had 4 cans of water.
CAPCOM Roger.
SC I think I was on the biomed all the time
last night too, so you can check out that sleep.
CAPCOM Okay, Ron, while you've got that book with
you, I can give you a one-line change to the E memory load as
a result of our changing the short burn constant.
SC Okay, stand by one there.

END OF TAPE

SC Okay, Houston America. I've got the right page now.

CAPCOM Okay, it's page 1-43. It's load DELTA. Identifier #5 the old value is 01606, change that to 01637.

SC Okay. Be load DELTA and the octal identifier 05 and it's new value is 01637.

CAPCOM That's correct.

SC Okay. The LMP has got his suit on. They're connecting up the LCG water connection. And he's still unzipped.

CAPCOM Okay, Ron. In the flight plan you're coming up on a VERB 45 and then go into P00 prior to the P52. After going to P00 we'd like you to change to BD roll from AC. Over.

SC Okay, we'll change the BD roll. Looks like we're going to run into a problem on our P52 down here, with these guys getting suited. Is it really necessary now?

CAPCOM There's no time criticality on that. When they're out of the way, go ahead with it.

SC Okay. Good.

SC Okay, Houston. How do you read the LMP?

CAPCOM LMP is loud and clear.

SC Okay, Gordy I'm opening the hatch.

CAPCOM Okay.

SC And the light's still on.

CAPCOM Rog.

SC Okay, Gordy, index 1 plus - or plus 1.2.

CAPCOM Roger.

SC Okay.

SC Okay, Houston I'm going to forget the P52 for a while and maneuver to the docking attitude.

SC Undock attitude that is.

CAPCOM Roger.

CAPCOM Stand by on that one Ron.

SC Wilco

CAPCOM We want to be sure we can get some stars - good stars in the undock attitude.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/11/72 08:39 CST 107:46 GET MC384/1

CAPCOM Ron, this is Houston. We didn't see you
do a VERB 45. Over.
SC You're right. Here's one.
CAPCOM And if there's any - if there's no reason
why not, we'd just as soon you go ahead and do the P52 now.
Finish that off and then start the maneuver. Over.
SC Okay. The big reason is that Gene's getting
into his suit right now.
CAPCOM Okay.
SC As soon as he gets out and gets in his
suit we'll all do a P52 maneuver.
CAPCOM Okay.
CAPCOM Ron, Houston. Can you give us AUTO on
the high-gain?
SC Okay. Just a second Houston.
SC We're transferring to LM power, Houston.
SC Okay, OFF, read that. Back to OFF. Okay,
we have LM power.
SC Okay, that was 107:49:28.
CAPCOM Roger.
SC LM water is open; 02 is open.
CAPCOM Roger.
SC Okay, 3-4, Houston, in the LM and step
one is good.
CAPCOM Okay.
SC Okay, step 2 is complete.
CAPCOM Okay, Jack.
SC And I'm going off of CSM COMM and I'll
be coming at you before long on S-band if I can.
CAPCOM Okay.

END OF TAPE

CAPCOM Ron, Houston; we've taken a look at stars available in the undock attitude and they don't look too good. We suggest you use the present attitude for your 52 and then maneuver. Over.

SC Okay, I'm just about to get Gene out of the way here and then I will.

CAPCOM Okay, and we're less than 3 minutes to LOS now, so when you finish that 52 we'd like you to copy down the NOUN 5 and 93's for us.

SC Okay, will do.

CAPCOM America, Houston, about 1 minute to LOS. Nothing further you, we'll see you on the other side.

SC Okay, Gordo, we're hustling like hell, we might make it.

CAPCOM Roger.

PAO This is Apollo Control at 107:59 ground elapsed time into the mission of Apollo 17. We've had loss of signal at this time as Apollo 17 coasted behind the Moon on the tenth lunar orbit. Approximately 47 minutes until the spacecraft both come around the far side as the crew prepares to transfer into the lunar module; that is, Cernan and Schmitt prepare to transfer into the lunar module. Get it powered up in preparation for today's activities of the descent orbit insertion maneuver number 2 and ultimately the landing at Taurus-Littrow and the first extravehicular activity. As they come around the Moon on the eleventh revolution, they will have checked out the lunar module with a few exceptions such as they will deploy the landing gear after acquisition of signal. Also at that time, both spacecraft, Challenger and America, though still docked, will be on separate air to ground links. The lunar module will be on the normal channel; the command service module link, with Ron Evans, will be piped into Room 161 in the News Center building for those newsmen covering the mission who prefer to listen to the command service module orbital science activities. As Apollo 17 went behind the western limb of the Moon, the orbit measured 12 nautical miles at pericyynthion and 60.2 at apocynthion. Some maneuvers coming up - the next major maneuver for the lunar module will be the descent orbit insertion number 2 which at this time is predicted, or is calculated to take place at a ground elapsed time of 112 hours 1 minute 59.1 seconds. Total burn time of 21.8 seconds. For a Delta V or velocity change of 7.6 feet per second, which will change the orbit to an apocynthion of 60.4 nautical miles and a pericynthion, or nearest approach, which is just uprange of the landing site, of 6.7 nautical miles.

APOLLO 17 MISSION COMMENTARY 12/11/72 08:47 CST 107:54 GET MC-385/2

PAO The big maneuver of the day, of course, is powered descent and landing, which at this time is calculated to take place at a ground elapsed time of 112 hours 49 minutes 27 seconds, lasting 11 minutes and 57 seconds, plus whatever hover time is available as they get down to the landing site. Total Delta V, or velocity change, to get out of orbit and break into the descent pass and ultimately the hovering and touchdown at Taurus-Littrow is 6693 feet per second. Some 43 minutes now away from acquisition as Apollo 17, America and Challenger, come from behind the Moon on orbit number 11. And at 108:04 ground elapsed time, this is Apollo Control.

END OF TAPE

PAO This is Apollo Control at 108 hours 44 minutes ground elapsed time. Less than 2 minutes away from acquisition as America and Challenger, the spacecraft of Apollo 17, come around from behind the Moon on lunar orbit number 11. At that time the voice downlinks from both spacecrafts will be separated. For those newsmen in Houston, who wish to listen to the voice from Ron Evans in the command service module, this will be available in room 161 in the Newscenter Office Wing. At the time the spacecraft reappears from behind the Moon, the crew should have completed most of the lunar module checkout procedures, and be prepared for deploying the landing gear, and a series of communication checks with the ground. Just before loss of signal on the eleventh revolution, the crew will be given a GO NO-GO for undocking and separation, which will take place during the time when the spacecraft is behind the Moon near the end of revolution number 11. In other words, when they reappear again, they will be flying separately on the twelfth revolution. We should have acquisition any moment, now, we've counted down to zero on the acquisition of signal clocks here in the Control Center. It takes a few seconds for the ground to lock up solidly with the downlink signal with the spacecraft. Network reports acquisition of signal, let's bring up the line and listen for the first call.

CHALLENGER There we go, we should have done that in the first place.

CHALLENGER Okay. Okay.

CAPCOM Challenger, this is Houston. How do you read?

CHALLENGER Okay.

CHALLENGER Hello, Gordie, this is Challenger, we read you loud and clear.

CAPCOM Okay, you're readable - lots of background noises at the moment.

CHALLENGER Okay, we'll update you in just a minute.

CHALLENGER Okay, Gene, that lock - -

CHALLENGER Okay, another one is verify locked, the band was up, it's locked here, the red thing is in, and and we're buttoning you up.

CHALLENGER Okay, I got it over here.

CHALLENGER Okay.

CHALLENGER Okay, comm checks (garble) Gordie, Jack will update you in just a second, and I've got some words for you, but I'd like to give you an E memory dump as soon as you get the steerable, okay?

CHALLENGER Okay, Gordie, how do you read the LMP? This is your S-band PR in secondary power amp check.

CAPCOM Okay, LMP, you're clear - lots of background noise though.

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CHALLENGER Okay, I'm going to bring up the steerable.
CAPCOM Okay, go ahead.
CHALLENGER Okay, steerable lock.
CHALLENGER That should get it.
CHALLENGER Okay, yaw minus 22. Yaw is good.
CHALLENGER Do you know where our cue cards are?
CHALLENGER Okay, Houston, how do you read.
CAPCOM Okay, you're loud and clear, Jack.
CHALLENGER Yes, they're in the data file. Hey, Ron.
We need to check out that VHF. Try to get that done before
you close up, Ron. Houston, we'll be right with you. We're
going to check out our VHF. Let me finish this part of it
and then we'll get that. Okay, you want to read that to me,
Gene, the S-band? Okay, where are you now.
CHALLENGER I'm right here in the middle of the page.
CHALLENGER Okay, S-band, PM PM, secondary -
CHALLENGER Houston, how do you read the LM?
CAPCOM Loud and clear, Jack.
CHALLENGER Okay, we're in step 2 and we're giving
you your second S-band check, and I'm going track mode AUTO.
CAPCOM Okay, you sound good.
CHALLENGER Okay, Houston, I can hear the antenna
rumbling up there, but I still have not peaked, still reading
3.7.
CAPCOM Okay, you're loud and clear, Jack. It
looks like a good lock to us.
CHALLENGER Okay, we'll leave it. Okay, I'll leave
it there and going biomed right.
CAPCOM Roger.
CHALLENGER Okay, squelch is off, how do you read.
CAPCOM Still loud and clear.
CHALLENGER Roger.

END OF TAPE

CHALLENGER Okay, Houston, I'm ready to give you an
E-memory dump.
CAPCOM Okay, we're ready to take it, go ahead.
CHALLENGER Okay, Ron, How do you - Ron how do you read
on simplex BRAVO?
CHALLENGER I do not read you. Coming at you.
AMERICA Okay, I don't read you at all, Jack -
CHALLENGER Hey, Ron I do not read you, check your VHF
switch.
AMERICA Okay, I'm down to simplex BRAVO.
CHALLENGER Yeah, go ahead.
AMERICA I was talking B now, how do you read.
CHALLENGER I do not read you, do you read me?
AMERICA No, I don't read you at all here, Jack.
CHALLENGER No, I don't read you.
AMERICA Okay, I've got everything on in my auto panel,
let me try the other one for backup.
AMERICA Yep, I'm on left.
AMERICA On left?
AMERICA Let me go to backup.
CHALLENGER Okay, I've got you, I got you.
AMERICA You do, I haven't got you yet.
AMERICA Okay.
CHALLENGER Okay, how do you read on the VHF BRAVO, you're
loud and clear.
AMERICA Hey, I finally got you.
CHALLENGER That was my fault Ron.
AMERICA Okay, You were kindly clipping there for
a little bit, I got the last part of your transmission.
CHALLENGER Okay, it was just warming up, you're loud
and clear now.
AMERICA Okay, I heard - It was - I missed the gist -
it was just warming up, but I got the loud and clear.
CHALLENGER Okay, Houston. I've got a couple I want to
pass out to you.
CAPCOM Go ahead, Gene.
CHALLENGER Okay, when I first put in the - -
AMERICA LMP, how do you read now?
SC Okay, I read you loud and clear.
CHALLENGER Stand by Houston. Am I clipping now Ron?
AMERICA I didn't hear you at all that time.
CHALLENGER Am I clipping now?
AMERICA Yeah, you're still clipping. All I got was
now.
CHALLENGER Okay, how do you read now?
AMERICA Okay, how do you read now? I got that.
CHALLENGER Okay, I guess we're okay with the squelch.
AMERICA (Laughter) Then I missed that part of it.
CHALLENGER Ron, how do you read Gene.
AMERICA Okay, loud and clear, Gene.
CHALLENGER Okay, very good.

CHALLENGER How do you read LMP now, Ron?
AMERICA Now, you're still clipping Jack. Can you bring
your mikes a little bit closer or something.
CHALLENGER Okay, how do you read now?
AMERICA No, I didn't read you at all that time.
CHALLENGER How do you read now?
AMERICA Loud and clear.
CHALLENGER Okay, I've got the squelch to full decrease.
AMERICA Well, you're going to have to yell or something
you're still clipping yourself out Jack.
CHALLENGER Okay, can you read Gene, Ron?
AMERICA No, I didn't read you that time.
CHALLENGER Okay, we're going to press on and get these
VHF checks GO, we can set them.
AMERICA Okay.
CHALLENGER Okay, switching ALFA, BRAVO's off, simplex
ALFA is on.
CHALLENGER Okay, Ron how do you read on ALFA?
AMERICA Don't read you.
CHALLENGER How do you read on ALFA Ron?
AMERICA Don't read you.
CHALLENGER How do you read the LMP on ALFA, Ron?
AMERICA Okay, I don't read you guys at all, except
through the tunnel.
CHALLENGER How do you read on ALFA, Ron?
AMERICA Okay, got you loud and clear that time.
AMERICA And, Gene can you verify the capture latches
are all engaged?
CHALLENGER Okay, how do you read me?
AMERICA I didn't read you at all Jack.
CHALLENGER This is Gene, how do you read me in ALFA?
AMERICA Didn't read you.
CHALLENGER Okay, let's press on you're getting it better -
we get it.
AMERICA Okay, got you that time. And check the capture
latches.
CHALLENGER Okay, Houston, I'm pretty sure the VHF is
all right - -
AMERICA Okay-
CHALLENGER It seems to have something to do with the
squelch setting and it's probably because we're so close.
CAPCOM Okay, we concur and we'd like you to press
on and not worry about the VHF anymore for now.
CHALLENGER Okay, Gordo, we are - here's a couple of
quick ones. When I push the LCG DSKY breaker in, I did not get
a restart light. The keyboard came up with 400 in R2. The
LCG light was already on and it went off as prescribed. When
I did a VERB 35 I got all the proper lights except when the LGC
and ISS lights came on, the entire caution and warning dimmed.
One more item. In our DAP setting, we are reading in our check-
list, for R-1, plus 645 and for R-2 plus 641, the DSKY DAP came
up plus 641 and plus 645 it just reversed those numbers. And I'm
going to deploy to landing gear.

CAPCOM Okay.
CHALLENGER Okay, Houston. Master arm is on and B light is on.
CAPCOM Got you.
AMERICA Yeah, I'm up in the tunnel, but go ahead.
CHALLENGER Ron, if you read, the landing gear is coming
on my MARK.
AMERICA Okay, I read you, go ahead.
CHALLENGER 3, 2, 1, MARK.
CHALLENGER Hey, Houston, we got a good one out front.
CAPCOM That's good.
CHALLENGER (Laughter)
CAPCOM We show them all deployed.
CHALLENGER And the flag is grey.
CHALLENGER Okay, the flag is grey.
CAPCOM Roger.
CHALLENGER Say, Houston. the primary evap flow time
108. Evap flow time 108:16:55. And I'm ready to copy your
abort constants and a DOI 2 PAD.
CAPCOM Okay, Jack. Here come the ABORT constants
224 is - -
CHALLENGER Stand by Gordy, ah -
CAPCOM Okay. Standby.
CHALLENGER Ron, when you get the tunnel closed out I'll
need you for an IMU course align.
AMERICA Okay, I'm getting the probe umbilicals
installed here.
CHALLENGER Okay, I need your NOUN 20s when you get a
chance.
CHALLENGER Okay, Gordy, you go ahead and you have DATA
on the updata links.
CAPCOM Okay, we'll have the uplink in a minute.
224 is 60470, 29364, 60386, 00594, 32772, 54404. Go ahead.
CHALLENGER Okay. 60470, 29364, 60386, 00594, 32772,
54404.
CAPCOM Okay, that was a good readback. Ready
with DOI-2 when you want it.
CHALLENGER Okay, Gordy, go ahead.
CAPCOM Okay, The - it's DOI 2 TIG time is 112:02:40.92,
NOUN 81 is a minus 00075. That will be Y plus all balls. And
DELTA VZ is also all balls - -
CHALLENGER Okay, Gene can you look at the capture latches
I've got it pre-loaded here now.
CAPCOM NOUN 42 00615 - -
CHALLENGER Okay, preload to (garble)
CAPCOM plus 00067,
CHALLENGER Okay.
CAPCOM 00075, Burn time 022, 000, 074
CHALLENGER We need - -
CAPCOM And 373 is a 01227.
CHALLENGER Oh the drogue, yeah.
CHALLENGER Yeah, it's locked in there.

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CAPCOM

The AGS DELTA Vs are N/A.

CHALLENGER

Okay, Gordy. 11202 40 - -

END OF TAPE

CHALLENGER 112, 02, 4092, minus 3075, plus all zeros,
plus all zeros; 00615, plus 00067, Z 00075, 022, all zeros,
074, 01227, rest of pad N/A.
CAPCOM That's correct Jack.
CHALLENGER Okay, stand by - let's see.
CHALLENGER Okay.
CHALLENGER Okay, I need your numbers then. NOUN 20.
CHALLENGER Okay, Gordy, I'm gonna start the lunar batt.
check and it'll be silent.
CAPCOM Okay, we're watching.
CHALLENGER Ron, I need you're - you're NOUN 20 numbers.
AMERICA Okay, I got 35695, 10634 and 00149. Right?
CAPCOM America Houston.
CAPCOM Challenger we want to get the attitude tweaked
back up closer to the normal before doing the course align.
CHALLENGER Hey, Ron, they want a more normal attitude
for you, we're not quite nominal.
AMERICA If you're talking to me it's about 0104.7
and then 0.
CAPCOM Challenger, the uplink's in there, it's your
computer.
CHALLENGER Okay, Gordon thank you. And Ron let me know
when you're tweaked up and I can go min deadband att hold.
AMERICA Okay, Houston, America, 0105 and 0, correct?
CAPCOM Yes sir.
AMERICA That's interesting, I don't know how it got
off attitude.
CHALLENGER Yeah, I was going to ask you the same thing.
CHALLENGER You might have knocked a stick or something
while everybody's flailing around down there. Could you -
CHALLENGER Maybe -
CHALLENGER Maybe I hit the stick or something, hyeah.
AMERICA Okay, Gene we're mid dead-band at hold, 01050.
CHALLENGER Okay, read out NOUN 20.
AMERICA Okay, VERB 6 NOUN 20. 000.32, 104.40, 359.55.
CHALLENGER Okay, I got all those.
AMERICA Okay.
CHALLENGER Okay, Houston I skipped a step on lunar batt
off reset, I'll go back.
AMERICA Okay, Houston, darn I forgot to release the
docking latches, okay. I'm going to release docking latches 1 and
7.
CAPCOM Okay.
AMERICA If I just put the - no I won't do that.
CAPCOM Jack, we need the - I think you missed a step
we need -
AMERICA I'll put circuit breakers in.
CAPCOM - CDR lunar batt off reset.
CHALLENGER That's right I'll go -
CHALLENGER That's affirm, I'll go back, stand by.
CAPCOM Okay.
AMERICA Okay, there's number 1, one's release, 2 releases,
and it's free.

CHALLENGER Okay, I'm back to lunar batt reset.
 AMERICA 7 -
 CHALLENGER LMP lunar batt off RESET.
 CAPCOM Roger.
 CHALLENGER Okay, Gordy, for the LM, I've got 300, 188,
 284,
 AMERICA One released, 2 released and it's free.
 CHALLENGER - 040, and 3 balls 45, how does that sound?
 CAPCOM Stand by we're checking.
 AMERICA Okay, dock and probe circuit breakers, 2 of
 them are going closed.
 AMERICA Main A, Main B.
 AMERICA Probe extend release end is going to -
 CAPCOM Okay, Geno, those angles are okay.
 AMERICA (garble) ah ha, I got 2 barber poles.
 CAPCOM That's a go, Ron.
 CHALLENGER I kind of figured they were, they're going in.
 AMERICA Lock and probe circuit breakers are going
 OPEN.
 AMERICA Okay, extend release is - and they went grey
 of course when they went OPEN. Okay extend releases to OFF.
 AMERICA Verify probe extend latch engaged and computer
 is not visible. I handled those a while ago, but I'll go look again.
 AMERICA It's only a hit EXTEND, with the circuit
 breakers in.
 AMERICA Mighty fine, it's still back inside there;
 extend latches still engaged.
 CHALLENGER Okay, Ron, on my MARK, I'd like an 0620.
 AMERICA Okay, standing by, go ahead.
 CHALLENGER Okay, 3, 2, 1, MARK it.
 AMERICA Okay 000.44, 104.63, 359.69.
 CHALLENGER Okay, got those.
 CAPCOM Okay, Challenger, we've got those angles
 here on the ground -
 CHALLENGER Okay -
 CAPCOM - both spacecraft.
 CHALLENGER Fine Gordy.
 AMERICA Okay, Houston, ED batt, 37.2, 37.2 and 109 14 00.
 CAPCOM Roger.
 AMERICA And all battery indications onboard were normal,
 once I got started.
 CAPCOM Okay, they look good to us also.
 CAPCOM America, Houston, in order to get on and stay
 on -
 CHALLENGER Ron, I want you to stay in that min dead-band
 (garble) P52.
 CAPCOM - the timeline (garble) 10 minutes after PDI
 we can let that one go, and if you'd like to let the camera
 business slide till after your suit check and we'll get those
 things, I'll come back and remind you of those too.
 AMERICA Okay, I've got the cameras all set - I got
 them out anyway, I don't have the right values on the lenses yet
 but anyhow the cameras are out and they're loaded.

CAPCOM Okay.

CHALLENGER Houston, this is the LMP -

CHALLENGER - couple minor things on the back pack check-out. The secondary glycol pump, when I started it, the sound and the pressure was ragged, isolated around - 20 psi and then stabilized. About 15 seconds, it sounded smooth; it had a sound as if it was cavitating a little bit, but after that it was smooth, over.

CAPCOM Copy that Jack.

AMERICA Okay, Houston, why don't I go ahead and get the PGA ver out of the way -

CHALLENGER And step 3 on page 3-15 -

AMERICA I rather get the data first.

CHALLENGER When I went to deadband one, I got a master alarm -

CAPCOM Why don't we go ahead and get the PGA and I'm -

CHALLENGER - but all other indications were okay, and the master alarm reset.

CAPCOM - and could you tell me if you ever got around to playing with the squelch on the VHF?

CAPCOM Okay.

AMERICA (garble) I'm sorry I -

CHALLENGER (garble) -

END OF TAPE

CHALLENGER I'm sorry, I misinterpreted the words there, I should have gotten that. Forget that one.

CAPCOM Roger.

CHALLENGER And -

CAPCOM We concur.

CHALLENGER We are squelch A now. We've got it all the way down to 1 and I still don't hear them.

CAPCOM Okay, you did get a satisfactory check on your side didn't you?

CHALLENGER Okay, Geno, you need some help?

CHALLENGER Oh, yes.

CHALLENGER Okay, I've got to satisfy you - every once in awhile I can hear them now, they're cutting in and out somewhere, I don't know where.

CAPCOM Alrighty.

CHALLENGER Okay, squelch A and ACCEPT is set about 4.

CAPCOM Okay, America, we'll give you a state vector if you'll give us ACCEPT.

AMERICA Okay, you have it.

CAPCOM Thank you.

CHALLENGER What star have you got, 30? Or no, what star? Loaded it, A, A and those are the numbers. Looks good. Okay, you ready to mark? What do you want first? No, good one.

CAPCOM Jack, we'd like to take a look at the glycol pump pressure. Can you close the glycol pump secondary pressure breaker?

CHALLENGER Better finish this.

CHALLENGER Gordie, you want the secondary?

CAPCOM That's affirmative, panel 16 glycol pump secondary breaker - third row in the middle.

CHALLENGER Okay, we've got a glycol light, and the temperature is 50.

CAPCOM Okay, the pressure looked good there, without that breaker back open. The master alarm you have is normal.

CHALLENGER Roger, understand it.

AMERICA Houston, America. How much time till AOS yet - or LOS?

CAPCOM Oh, about 29 minutes.

AMERICA Okay. Have a little time for the PGA there, then, I guess.

CAPCOM And it's your computer any time you want to get to it, Ron.

AMERICA Okay.

AMERICA Ahah, I have the old Hamilton Blues on.

AMERICA More cables all over the place than I know what to do with.

APOLLO 17 MISSION COMMENTARY 12/11/72 CST 10:10 GET 109:17 MC-389/2

CAPCOM That place looks like a pig pen, you've
run the same course everybody else has I guess.
AMERICA (laughter) I've got cables and hoses and -

END OF TAPE

AMERICA Okay, hit the stick again. Now I've got to unlock it.

CHALLENGER Ron, keep in mid deadband and hold. I've got to finish the P52.

AMERICA Okay, you want me to move her back to attitude now or just -

CHALLENGER No, just stay where you are.

AMERICA We're on attitude just a little bit.

CHALLENGER Just stay where you are. Put it in mid deadband.

AMERICA Well, I'm on mid deadband but i've maneuvered out of attitude. You want to go back to regular attitude?

CHALLENGER No. NO, no.

AMERICA Okay, Houston, (garble) return is closed. mid flow valves. The other 2 are closed. Mine is open and I got the interconnection between the other ones.

CAPCOM Sounds good.

AMERICA And we'll (garble) pressure. Okay, looks like pretty good. Okay O2 flow is lower limit. Okay, we'll scoop the press. Here we go. It's going up to press. And it feels like it's going up. And (garble) here now (garble). O2 flow high.

CHALLENGER Hey Ron. This is Challenger. We're going to be off your loop for awhile so we can finish the marks.

AMERICA Okay, wait a minute Jack, I'll just go to receive on the VHF. I'll just go to receive on the VHF, Jack.

AMERICA Okay, let's see, there's a Delta P in the book. Six and a half - how are we going to cycle 6 (garble) return here? Okay, it's out, it's back in. Okay, now we can squirt a little more O2 flow in. Uh, Hu - there we go. Now, man. Direct O2 is off. It's coming down. Gee, I read 4.5 in my suit. Is that right? By.

CAPCOM Looks like - looks like about 4 on our meter, Ron.

AMERICA Well, I'll be darn. The suit gage reads 4.5. They wasn't that close in there. 6, 8, - maybe 9 or something like that. That's closer to 4. I can't tell for sure what it feels like. They have O2 closed down. Not leaking very much. I'm reading about a .3, something like that.

CAPCOM Okay, we're - we're showing 4.2 to 4.3 on our pressure spread near cabin and 2 pressure gauges probably show something similar.

APOLLO 17 MISSION CONTROL 12/11/72 10:20 CST 109:27 GET MC390/2

CAPCOM And we show that the flow rate is down.
AMERICA All right, that's not too bad. That's
pretty close.
CAPCOM Yeah, and the O2 flow is staying pretty
good.
AMERICA (garble) on this thing, huh?
CAPCOM Sounds good.
AMERICA Okay, so it looks like it's stable there,
isn't it?
CAPCOM Yes sir.
AMERICA Okay, let's do the depress. (garble)
my ears are pretty good. If you guys don't care, I'm going
to go to OFF. Save a little time, here.
CAPCOM America, I don't know if I copied you
corectly. You don't want to go to off on two tests valves
until pressures are back down to normal. If that was what
you asked.
AMERICA (laughter) Hello Houston.
CAPCOM Or are you already there?
AMERICA That looked to be a pretty good alignment
from where I saw it. There's O7 for you.
CAPCOM Okay, we copy.
AMERICA Yeah, my ears are popping to beat the band.
I changed my mind. I'll let it go down slowly.
CAPCOM Okay.
CAPCOM Okay, and we've got about 20 minutes
before LOS so while there's no hurry on those pads I've got
them standing by when you're ready. And didn't know what you -
what you had in mind about working on these things. We might
get - We might get started on the hatch integrity check if
you get to that point and I - (interruption)
AMERICA Okay, Challenger.
CAPCOM (garble) for it to bleed down or whatever
turns out to be convenient.
AMERICA Okay, let's see. I guess it's about time
to - to recyc okay.
CAPCOM Okay.
CHALLENGER Hello, America, Challenger. We no longer
need you. This is deadband.
CAPCOM (garble through interruption by Challenger).
AMERICA Okay Challenger, America here. I'll go
back to CMC.
CHALLENGER Okay, but I would like NOUN 20 from you
on my mark.
AMERICA Stand by.
CHALLENGER Okay, go.

APOLLO 17 MISSION COMMENTARY 12/11/72 10:20 CST 109:27 GET MC390/3

AMERICA Okay, 321 mark. Okay, 002.15 104.36
359.69.

CHALLENGER Okay.

CAPCOM Okay, Challenger, we've got the NOUN
20 from both spacecraft.

CHALLENGER And Houston, do we want to release those
docking latches before they do their hot fire I don't think so,
do we?

CAPCOM Okay, stand by.

CAPCOM Challenger, Houston, we're ready anytime
for the RCS pressurization. You might turn the data switch
off.

CAPCOM We'll just hold up on that until the hot
fires are over. So when you get your copying hand ready, I'll
give you some PAD's.

CAPCOM Okay.

END OF TAPE

CHALLENGER Okay, (garble)
CHALLENGER Master alarm is on, I've got one good
light - system A.
CAPCOM Okey doke.
CHALLENGER Okay, Houston, let's see. Where are
we going to start the PAD.
CAPCOM Okay, and you might go to block on com-
puter 2.
CHALLENGER Okay, I'm going to mark, 3 2 1, mark it.
CHALLENGER We heard it.
CHALLENGER The first thing I'll give you is the SEP
pad, and that's on page 113, okay?
CAPCOM Okay.
CHALLENGER Noun 33 is 110275500, roll is 0 105 PITCH,
and YAW is 0.
CAPCOM Okay, Challenger, we (garble) and it
looks good - RCS looks good.
CHALLENGER (garble) 175.00, and roll, pitch, and yaw
as predicted.
CHALLENGER 1050, right?
CAPCOM That's affirm.
CHALLENGER Okay, got it. Okay, the next thing I
have for you, that goes on page 115.
CHALLENGER Okay, suit test valves on OFF now, on
page 115.
CHALLENGER Okay, got it.
CAPCOM Okay, it will be 17-11105813, T2 is 1110030
0100.
CHALLENGER We're in high bit rate, and Ron, we need
your advice, deadband attitude hold.
AMERICA Better hold it, hold it -
CHALLENGER Okay, wide deadband at hold -
AMERICA And Houston, America, I'm at T2.
CAPCOM Okay, are you ready to go back
to it now?
AMERICA Okay, ready for T2.
CAPCOM Alright, T2 1110030 0100 -
CHALLENGER Here we go Houston with the cabin regulator
checks.
CAPCOM Stay off that - 0126, ROLL 015297000,
north 02. Over.
CHALLENGER Okay, I'll read back what I have - T1 -
1105813 omit T2, PGA is 0100, T3 is 0126, ROLL 15, PITCH 297
and 0, north 02, I presume 17.1.
CAPCOM Yes sir, and T2 time is 1110030.
CHALLENGER Okay, 1110030.
CAPCOM That's correct.
AMERICA Challenger, it does something every time
you talk to -
CHALLENGER Okay, Houston, page rate command cold
fire (garble) cold fire checked

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CAPCOM Okay, pass on.
AMERICA Hey, Jack. Could you go to receive only
on the VHF for a little bit?
CHALLENGER Sure Ron.
AMERICA Okay.
AMERICA And Houston, America. You can go ahead
on the next page.
CAPCOM Okay, on page 113. I've got a DAP mode
for you.
AMERICA Okay.
CAPCOM Okay, the weight 37983 plus 040 plus 091.
AMERICA Okay, CSM weight is 37983, (garble)
plus 0.40, (garble) plus 091.
CAPCOM Okay, that's correct and the last one
comes up on page 121 and it's a LM P76.
AMERICA Ahah, okay.
CHALLENGER Alright, Houston 10-4, I have rate com-
mand cold power 4 jets hot fire checks.
AMERICA Wonder what that is.
CAPCOM Okay, go (garble) 112025192 minus -
CHALLENGER Hold it, America, this is Challenger.
AMERICA How far do you want it free, Challenger?
CHALLENGER It's affirm, go CMC mode free.
AMERICA Challenger, America. You want free for
hot fire?
CHALLENGER That affirm, we want free, Ron.
AMERICA Okay, I'm going to free now.
CHALLENGER At the end of the marking, let me try
that again.
CAPCOM Alrighty. Noun 33 is 112029192 minus
00075 and all zips for Y and Z.
AMERICA (laughter) Okay start NOUN 33 again.
AMERICA Houston, America. We're cut out on
NOUN 33, and I've got minus 0007.5 in X and Y and Z are zero.
CAPCOM Okay.
AMERICA And the time 112025190.
CHALLENGER Houston, hard over looked good from over
here.
CAPCOM Okay, looked good down here.
AMERICA NOUN 33 was 112025190 -
CHALLENGER Okay, Houston B min. impulse hot fire checked.
CAPCOM Okay.
AMERICA 112025192.
CAPCOM That's correct.
CHALLENGER Okay, Houston. We have a sticky
count back red on system A quad 4 and it went grey with a
tap.
CAPCOM Okay, Jack.

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CHALLENGER Okay - Ron, the hot fire checks are
complete, you can go into wide deadband and hold.
AMERICA Okay, Challenger, America, your in hold
at hold. You didn't get very far off that time either.
CAPCOM Roger, those all looked good here.
CHALLENGER I think we got them all.
AMERICA Okay. Okay, Gordo, I understand.

END OF TAPE

CHALLENGER Okay, we're on the top of 3-48 Gordo.
 CAPCOM Roger. We're with you.
 AMERICA Okay, Challenger, America -
 CHALLENGER Go ahead, Ron.
 AMERICA Okay, I'm going to turn off B-3 and also
 my roll jet and undo the docking latches.
 CHALLENGER Okay, you want to verify your transponder is
 OFF as well as B-3?
 AMERICA That's verified, transponder is OFF.
 CHALLENGER Okay, and you did get the umbilicals, right?
 AMERICA Say again about umbilicals.
 CHALLENGER You did get the LM to CM umbilicals, right?
 AMERICA No, all I get is umbilicals, I didn't get the
 question.
 CHALLENGER Did you disconnect the LM to CM umbilicals,
 verify.
 AMERICA Verify, I have those down here.
 CHALLENGER Okay. Very good.
 AMERICA And jet Bravo 3 is off.
 CAPCOM Okay, Ron we're about 5 minutes from LOS and -
 and the only thing that you will be able to (inaudible)
 CAPCOM Challenger, Houston. We cannot completely
 explain the start up indications you had on the PNGS, but they
 are of no great concern. It looks good so far, the DAP Gimbal
 Trims are no problem. Don't bother changing them. And there
 will be no PIPA bias update, yet anyway. Over.
 CHALLENGER Okay, understand. Was the checklist written
 backwards on this.
 CAPCOM There was a Cape problem on there tape and
 they had it reversed. But, it's in a noise level anyway, no
 problem.
 CHALLENGER Okay.
 CAPCOM Challenger, Houston. You have a GO for
 undocking and sep.
 CHALLENGER Roger, understand. A GO for undocking and sep.
 CHALLENGER Okay, number 5.
 CHALLENGER 1, 2, and it's fully released and the hook
 is off the docking ring.
 CHALLENGER Okay, number 6. Is 1, 2 and it's fully
 released and the hook is off the docking ring.
 CHALLENGER Okay, 7 is released and the hook is off the
 docking ring.
 CHALLENGER 02 flow still okay?
 CAPCOM Yes sir, looking good.
 CHALLENGER Okay. Here's number 8.
 CHALLENGER 1, 2 and the shoots's fully released and the
 hook is off the docking ring.
 CHALLENGER Okay, Houston. Number 9. 1, 2 and she's
 fully released and the hook clears the docking ring.
 CHALLENGER Okay, number 10. There's 1, 2 fully released
 and it clears the docking ring.
 CHALLENGER Ah, 1, 11, Okay, handle free, J-hook clears
 the ring. Only got one more to go. There first latch, that's

CHALLENGER 2 latches, sounded like it came over and that stays clear, handle is free. Now, by golly they're all off.

AMERICA Hey, Challenger, you're hanging on to those three little bitty things.

CHALLENGER Okay, fine Ron.

AMERICA Okay, put the old - -

CAPCOM Challenger, you still have about 1 minute to LOS and we'll see you when you come around the other side independantly.

AMERICA Hatch in.

CHALLENGER Okay, Gordo, understand - -

CAPCOM Okay, Ron, we're within a minute of LOS. O2 flow still looks good, and the rest of the stuff we can get on VHF is coming in just fine.

CHALLENGER (garble)

AMERICA Okay, I'll get that VHF stuff and then put the hatch in.

CAPCOM Jack, just a friendly reminder to do the LOS procedures on the steerable.

CHALLENGER Okay.

CHALLENGER Okay we're ready to receive only to B DATA.

AMERICA Hey Challenger, America I'm going to receive only B data.

AMERICA Hey Challenger (static)

PAO This is Apollo Control. We've had LOS of signal as America and Challenger pass behind the Moon on the - toward the end of the 11th Lunar Orbit. When they reappear again approximately 47 minutes, they will be undocked. Station keeping flying along adjacent to each other. At LOS of signal the orbit measured 61.2 nautical miles pericyynthion by 12 miles even nautical - pericynthion. Velocity at that time was 5315 feet per second. During the next front-side pass, as the Challenger continues in preparations for the descent orbit insertion we'll have a checkout of the descent propulsion system. The tanks will be pressurized and telemetry readouts here on the ground will be prepared to those on board, to make sure that, that system is preforming as advertised. An alignment - realignment of the inertial measuring unit, part of the lunar module's guidance system will be run during that - also during that front-side pass. And toward the end of the 12th revolution, just prior to LOS of signal the crew aboard Challenger will be given a GO/NO-GO for the Descent Orbit Insertion Maneuver #2, which is at this time still scheduled for a ground elapsed time of 112 hours 1 minute 59 seconds. There's a carton of book matches on top of the flight director-console here in the Control Center which was bought by a group of flight dynamics officers on all the ships. Bill Boone, Jay Green, Jerry Bostick and others. It's a blue match cover, it says The Trench. Traditionally the trench is the front row here in the Control Center where the flight dynamics people operate. It says on the front The Trench, Mission Control Center, Houston. On the reverse of the match book it says Mercury, Gemini, Apollo, Skylab, Apollo Soyuz Test Program Shuttle. Mercury, Gemini and Apollo have a check by them

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PAO indicating they're complete. And at the
bottom it says roll them out, we're ready. At 109:57 up live
at next acquisition of signal as America and Challenger come
around on the 12th revolution, this is Apollo Control.

END OF TAPE

PAO This is Apollo Control. One hundred ten hours, 39 minutes ground elapsed time in the mission of Apollo 17. Less than 2 minutes remaining now until America and Challenger separated and flying a few feet apart at this time will come around the front side of the Moon on the 12th lunar orbit. Slightly over a minute now until we should start attempting to lock up on the downlink signal from America and Challenger. The two way communications from spacecraft communicator for the command-service module, Ken Mattingly, and Ron Evans aboard America will be on a separate loop as it was the last revolution. These conversations can be heard in room 161 in the Houston News Center. Early in this revolution we'll have the pressurization of the descent propulsion system and checkout of that system. Some 6 - 5 seconds from acquisition we'll stand by until Network advises the Flight Director that they do have firm lock on. We have AOS in lunar module, let's see what we hear.

CAPCOM Hello Challenger, Houston, you're very, very weak, over.

CHALLENGER (considerable background noise) Okay, Houston, (garbled) we're looking at America the beautiful.

CAPCOM Okay, Geno I understand we're locked on but we're not reading you (garbled).

CAPCOM America, Houston standing by.

AMERICA Okay, Houston, America, we're floating free out here. The Challenger looked real pretty. The residuals on the P41 were plus 1.9, minus .2, and 0; undock and sep was on time.

CAPCOM Sounds good.

CHALLENGER Houston, this is Challenger. Won't hold on the steerable antenna yet, it looks like I'm getting oscillations in my uplink signal strength and then gradually drops off to zero.

CAPCOM Okay, Jack, we're reading you better now, understand.

CHALLENGER Okay, Gordo, if you're reading, you got the words we are undocked. Landing radar film test was go. We're ready to press on to the zip tunnel check, and we've been looking at America the beautiful on its rare form.

CAPCOM Okay, Geno, we've got that. It sounds good.

CHALLENGER Okay, and the residuals on 247 at undocking we're at 0 minus .1 and 0.

CAPCOM Okay, we copy that. We'd like you to try the steerable again.

CHALLENGER Okay, Houston, we've got it.

CAPCOM Okay, you sound real good, loud and clear.

CHALLENGER Okay, let me give you some NOUN 20 angles, if you want them.

CAPCOM Go ahead. Ready to copy.

CHALLENGER The LM: plus 30109, plus 28453, plus 35948.
The CSM: plus 00035, plus 10467, plus 00052. The time: 110:24:00.
Over.

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CAPCOM Okay, Jack, we got that.
CHALLENGER Okay, Gordo, we're ready. DPS throttle check,
I'm ready to hit engine stop.
CAPCOM Stand by. Okay, we're ready.
CHALLENGER Okay. and the light is on. The reg light
is on.
CAPCOM Roger. We're showing the engine on circuit
breaker may be out. Would you check that?
CHALLENGER Okay, I'm sorry, Gordy, a little - we missed
that here. Okay, we'll try it again.
CAPCOM America, Houston. We have an opportunity,
how about cycling the high gain to Wide and then back to REACQ.
AMERICA Okay, can do.
CAPCOM Thank you, sir.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/11/72 11:40 CST 110:47 GET MC394/1

CAPCOM Okay, America, how about going back to narrow on the antenna. And verify that you're loaded on 934. They went by so fast on that, we didn't get a chance to look it it.

CHALLENGER Gordy, the internal (garble) looked okay (garble).

AMERICA There, you got it?

CAPCOM Okay, that looks good.

AMERICA Does that look okay?

CAPCOM Yes sir, sure does.

AMERICA Okay, No update then, huh?

CAPCOM That's correct.

AMERICA Okay.

CHALLENGER Okay, Gordy, the master ARM is coming on.

CAPCOM Roger.

CHALLENGER I got two good lights.

CAPCOM Two lights.

CHALLENGER Okay, on my mark. Reset prop iso valves. 321 mark it. We heard it.

CAPCOM Roger.

CAPCOM Okay, looks good.

CHALLENGER Gordy, there was a slight upward - Gordy, there was an upward fluctuation in pressure in the manifold when we fired that. It's back to where it was prefiring.

CAPCOM Okay, that's what it should have done, Jack.

CHALLENGER Okay, helium press, descent start - 3 2 1, mark it. We got it.

CHALLENGER Okay, looks good on board. About 240 both sides.

CAPCOM Okay, looks good on the ground.

CHALLENGER Say, Gordy, this thing sounds a little bit like my stomach sounded a couple of days ago.

CAPCOM Roger that.

CHALLENGER AGS coming on to standby.

CHALLENGER Okay, master ARM and AGS light.

CHALLENGER Okay, (garble) 110 5200 for the time on the AGS.

CAPCOM Roger, Jack.

CAPCOM Oh, Gene-o, we showed Jack's suit iso valve in suit disconnect. Should be in suit flow. Would you check that for - for us, please?

CHALLENGER Yeah, he's in suit flow now.

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CAPCOM Okay, thank you.

CHALLENGER I'll tell you - I'll tell you this LCG
sure makes a world of difference up here.

CAPCOM Roger.

CHALLENGER Hey, America, Challenger.

CHALLENGER Hey, Ron, listen. This ridge you're
coming on over - just stick your hand out the hatch and
grab a rock.

CHALLENGER Well, when you're looking at where you
are it even looks lower.

CAPCOM Challenger, Houston. I have a new AGS
K vector for you.

CHALLENGER Stand by a second.

END OF TAPE

CHALLENGER Go to K vector.
CAPCOM Okay, it's 109:59:59.94, over.
CHALLENGER 109:59:59.94.
CAPCOM That's right.
CHALLENGER Gordo, this is spectacular. It is absolutely spectacular looking at that command module, America down there coming across the surface. We're just tracking them at about a 30 degree dive angle.
CAPCOM Sounds great.
CHALLENGER Okay, babe, have a good time, and go get that landmark. Don't forget TEIC in about 3 days.
CAPCOM Geno, Houston with a couple of items.
CHALLENGER Go ahead, Gordo.
CAPCOM Okay, your perilune seems to be -
CHALLENGER Hey, we got the landing site Gordo.
CAPCOM Okay, I'll hold -
CHALLENGER Gordo, we got the landing site, we're coming right over the front of it; stand by a minute, you can see the Slide, I think you can see the Great Cross.
CAPCOM Roger.
CHALLENGER We'll get a picture of America coming right across it.
CAPCOM All righty.
CHALLENGER Super targeting. God, we've got Family Mountain, we've got Corsa Massif; we can see the Scarp, we can see the light mantle; I've got the Great Cross, Camelot, Sherlock, believe it or not, Houston, they're all there.
CAPCOM How about that.
CHALLENGER I see possible structure - possible structure in the upper part of the South Massif, little bit east of station 2. It's some horizontal, dipping to the southeast. Houston, I can even see Poppy, right where we're going to set this baby down.
CAPCOM Very good.
CHALLENGER As a matter of fact, I can see Rudolph. I can even see the triangle: Rudolph, Frosty and Punk.
CHALLENGER Man, Gordo, this is absolutely spectacular.
CAPCOM Sure sounds like it.
CHALLENGER We can watch Ron track - we can watch Ron track right on through the landmarks, I don't what kind of results he got, but he had a nice smooth track from here.
CAPCOM Roger.
CHALLENGER Gordo, you can go ahead and update us with those words.
CAPCOM Okay, your perilune is shifting west PDI will be a little higher than nominal: 10.7 miles or 65 000 feet; should be no problem. And from the time you first came around till we had a solid lock up on the steerable on this acquisition was about 3 minutes, we're going to try to speed that up some on the next time around. We'd like you to just keep trying the steerable until we come to you - and say stop trying. Over.
CHALLENGER Okay, Gordy understand that and apparently this time, had I let - had I waited a little longer, it would

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CHALLENGER have dropped to zero and then come up, because that's what happened when I finally got you. I'll give it more time next time.

CAPCOM Okay.

CAPCOM And, Jack, I've got lots of PADS for you whenever you're ready.

CHALLENGER Okay, Gordy, go with the PADS.

CAPCOM Okay, the first one is a P76 with a CSM circ.

CHALLENGER Go.

CAPCOM Okay, NOUN 33 is 111:57:30.09. NOUN 84: plus 00705, plus 00000, and minus 00005, go ahead.

CHALLENGER Okay 111:57:30.09, plus 00705, plus all zeros, minus 00005.

CAPCOM Okay, good readback. Next one I have is a no PDI plus 12 abort Adam Echo.

CHALLENGER Go ahead.

CAPCOM Okay, Echo is 113:02:00.00. Foxtrot plus 01034, plus 00000, minus 00500, NOUN 42: 01420, plus 00054, 01149. Burn time is 048 000 272 373.

CHALLENGER Okay - give me a transponder, and we'll start with the radar, Jack's tied up right now.

CAPCOM 373 is 01820; AGS DELTA Vs plus 01037, plus 00000, minus 00493, Golf 113:57:00.00. Hotel - start over - 115:36:45.00, and the no DOI-2 DELTA Vx 00966. Two remarks: throttle profile is 10 percent for 26 seconds, 40 percent for the rest of the burn, over.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/11/72 CST 12:00 GET 111:07 MC-396/1

CHALLENGER Okay, readback. 11 - no PDI plus 12 - 11302, all zeros, plus 01034, plus all zeros, minus 00500, 01420, plus 00054, 01149 048 all zeros, 272, 01820, plus 01037, plus all zeros, minus 00493, 11357, all zeros, 11536, 4500, 00966, Remarks throttle profile 10 percent for 26 seconds, 40 percent for the remainder.

CAPCOM Okay, that's a good readback. Item India. 112, 49, 5235, - -

CHALLENGER Say Gordo

CAPCOM Go ahead.

CHALLENGER Gordo, Gordo, hey Gordo, stand by, we want to finish the radar VHF test and when I go to P52 you can finish the PAD's.

CAPCOM Okay.

CHALLENGER Okay, we're at VHF range and I've got you on radar, Ron, we'll be quiet for a second and see if you can get a lock on us.

AMERICA Ah ha it works, - -

CHALLENGER Okay.

AMERICA .50 miles.

AMERICA Okay, .50 or 49 miles.

CHALLENGER Okay, Gordo, the VHF ranging and radar checks out very well.

CAPCOM Okay, sounds good. Tell me when you're ready for item India again.

CHALLENGER We cut you off, Ron.

AMERICA Okay, I'm going to turn the ranging off, then. It counts a little better that way.

CHALLENGER Go ahead, Gordy.

CAPCOM Okay, India is 112, 49, 5235, 1101, plus 00022, attitude is 002, 108, 290, plus 56900, Juliet 115, 36, 4500, Kilo 117, 35, 4500. Go ahead.

CHALLENGER Okay, it's a PDI PAD 112, 495235, 1101 plus 00022, 002,108, 290 plus 56900, Juliet 115,36,4500, Karen 117, 35, 4500. Go ahead.

CAPCOM Okay, that's a good readback. Lima is 113, 14, 2491, HO 119, 34, 3000, and November is 114, 57, 1909. And your T2 at PDI, T2 will be at PDI plus 24:33.

CHALLENGER 24:33?

CAPCOM That's affirmative.

CHALLENGER Okay, Lima is 113, 14 2491, Mary is 119, 343000, and Nancy is 114, 541909.

CAPCOM That's a good read back.

CAPCOM Okay, one thing left Jack, is the SHe pressures on the PDI page?

CHALLENGER Go ahead.

CAPCOM Okay, at TIG the pressure will be 1310 plus 1 minute 1410, 2 minutes 1400, 3 minutes 1310, and 4 minutes 1230. Over.

CHALLENGER Okay I got those. Thank you.

CAPCOM Roger.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/11/72 CST12:10 GET 111:17 397/1

AMERICA You're loud and clear.
CHALLENGER Roger, America. Have a good burn.
AMERICA You look as good and pretty in earthlight as
you do in sunlight.
CAPCOM We see that, looks like a good job.
CHALLENGER Yes, but it's not an easy one, Gordo.
AMERICA Hey, Challenger, America.
CHALLENGER Go ahead.
AMERICA Okay, Jack, could you go to receive only
on your VHF there, I've got all these PAD's to do - to pick
up now. I'll call you when I'm all through.
AMERICA Okay, receive only.
CHALLENGER We got your GO, Gordo.
CAPCOM That's affirmative, torque them.

END OF TAPE

CAPCOM Challenger, we need aft OMNI and select a steerable that's slew and low bit rate.

CAPCOM Challenger, select forward OMNI please.

CHALLENGER Okay, Gordie, the coaxial line is good and the adapter feed back.

CAPCOM Okay, and like the rest of the spacecraft, the platform is beautiful, there's no contemplation of bias update.

CHALLENGER Beautiful. It's up and down like a SIM.

CAPCOM Roger, give you a 1 update, you'll write in the timeline page 8, the T1 time is TDI plus 1700. Over.

CHALLENGER Okay, T1 is TDI plus 1700, we got it.

CAPCOM Roger.

CHALLENGER Okay, Houston, you got POO and data.

CAPCOM Okay.

CHALLENGER Gordo, can I go over the AGS CAL while you're getting those uplinks ready?

CAPCOM Okay, we'd like the steerable back again. Try pitch of minus 25, and yaw of minus 72.

AMERICA Okay, you got the steerable.

CAPCOM Okay, we need high bit rate.

CAPCOM First, on the uplinks now, we'll get that in before we go to the AGS CAL attitude. Over.

CHALLENGER Okay, Gordo, I've got the earth and the direction I have to maneuver is nothing, but good for the high gain, so I'll start over slowly.

CAPCOM Okay.

CAPCOM Challenger, Houston. It's your computer. Updater A link off.

AMERICA Roger.

AMERICA Still with you.

AMERICA Okay, I've got something I'd like to get.

CAPCOM Say again, Ron.

AMERICA Okay, I just wanted to make sure voice check was still out there on the VHF comm.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/11/72 CST 12:30 GET 111:37 MC-399/1

CHALLENGER Okay, just wanted to make sure of voice
check we still have the VHF call.
AMERICA Okay, I'll have to give you another one in
a minute.
CHALLENGER Okay, how do you read?
AMERICA Okay, loud and clear, how me Jack?
CHALLENGER You're loud and clear.
AMERICA Challenger, America. Read you loud and clear
how me?
CAPCOM Okay, America. We show you in site for
twenty minutes and you have a go for sep.
AMERICA Houston, America. Roger. We'll do our best.
CAPCOM Challenger, Houston. You're GO for DOI 2.
CHALLENGER Thank you, Gordo. We're GO here for DOI 2.
CHALLENGER Okay, Houston, did you get the AGS cal numbers?
CAPCOM Challenger, that's affirmative.
CHALLENGER Okay, it all looks pretty good to me 546 may
be a little more (garble), but it looks pretty good.
CAPCOM Okay, looks good here.
CAPCOM Jack, have you gone through an OMNI, if you
have go low-bit rate.
CHALLENGER Okay, we got you on an OMNI and low-bit.
CAPCOM Okay.

END OF TAPE

PAO This is Apollo Control, we've had loss of signal as America and Challenger coasting along near-by each other, passed behind the Moon on revolution number 12. Some 47 minutes until they come back around again, on the 13th lunar revolution. Behind the Moon this time, the command/service module piloted by Ron Evans will do CSM circularization maneuver which will place the spacecraft back up into an almost circular lunar orbit, measuring 69.7 by 54.5, those are the targeted measurements of that orbit. Ignition time, again which will be behind the Moon and out of contact is ground elapsed time of 111:57:28. The lunar module DOI, or descent orbit insertion burn number 2 also will be behind the Moon before we reacquire the spacecraft. That is scheduled for 112 hours 2 minutes 40 seconds. It's a fairly small burn 7.6 feet per second which will lower the pericyynthion of the Challenger down to 6 1/2 miles - nautical miles with apocynthion staying at 61.5 nautical miles. During the next front side pass, comes the moment of truth with powered descent, and touchdown at Taurus-Littrow landing site as Challenger lights off the big descent engine at 112 hours 49 minutes, 52 seconds ground elapsed time. The ignition count-down clock in the control center is counting down to PDI some 59 minutes 17 - 16 seconds until ignition with landing shortly under 12 minutes later, depending on the amount of hover time available. The broadcast line will be brought up again just prior to acquisition of signal as America and Challenger come around on the front side again on revolution 13, and at 111 hours 51 minutes, this is Apollo Control.

END OF TAPE

PAO This is Apollo Control at 112 hours 33 minutes ground elapsed time in the mission of Apollo 17. Coming up on acquisition of signal with both spacecrafts, America and Challenger coming from behind the moon on the thirteenth lunar orbit. Some 1 minute 32 seconds away from acquisition of the command module and slightly under three minutes on the lunar module, Challenger. Challenger, during this revolution will descend to the surface of the moon and land at the Taurus-Littrow landing site. Ignition time currently is ground elapsed time of 112 hours 49 minutes 52 seconds. During the descent to the surface the spacecraft onboard computer will be generating numbers on the display which the lunar module pilot will call out to the commander and which - angles at which the commander should be able to see the landing site through a grid etched on the left hand window of the lunar module. Here, we have AOS. AOS of the command service module and the circulars - the circularization burn was good. This is Apollo Control on the air-ground 2 circuit. Command module pilot, Ron Evans, is giving the CAPCOM all of the residuals. Here comes Challenger. Back to the lunar landing sequence as the lunar module pilot reads out the angles that the commander ought to be able to see the landing site. The commander is able to run through an operation called redesignation by using a pitch hand controller to rotate the spacecraft.

CAPCOM Okay Challenger, you're loud and clear on the OMNI. How did it go?

CHALLENGER Okay. The burn was go. We're in a seven mile perigee into PGNCS and we had 0 plus .1 and plus .1 residuals.

CAPCOM Okay, sounds good.

CHALLENGER Ok - Okay, Gordy, I'm going to try the high-gain. I had you locked up once and then I lost you. Let me try it again.

CAPCOM We concur. Go ahead, Jack.

CHALLENGER Okay Gordy, that's mighty fine. You know you're uplinking. You've got the OMNI and I'll leave it.

CAPCOM Okay, we'll stay on the OMNI for the uplink.

CHALLENGER Okay, Gordy, ED bands to 37.2 both batteries. The ascent battery on time was 112:19:00 about 4 minutes late.

CAPCOM Okay, Jack, copy.

CAPCOM Jack, we want battery 3 off for preconditioning.

CHALLENGER Roger.
CAPCOM Challenger, we'd like you to verify the
NOUN (garble) egress.
CHALLENGER That's verified.
CAPCOM Roger.
CHALLENGER And do you have a 231 update?
CAPCOM Stand by.
CAPCOM Negative. No change, Jack.
CHALLENGER Roger. Okay, Gordo, how do you read
CDR on VOX?
CAPCOM CDR, you're loud and clear on VOX.
CHALLENGER Okay. How do you read the LMP on VOX?
CAPCOM Loud and clear, Jack.
CHALLENGER Okay, Gordo, up until this time the
bird has looked beautiful - perfectly plain. All checks
came out just as advertised.
CAPCOM Okay, sounds good.
CHALLENGER And we're looking at 9 minutes and
5 seconds from PDI.
CAPCOM Challenger, do we see a VERB 33
out of DSKY. If you do, enter it.
CHALLENGER Okay, it's there. I will enter.
CAPCOM Roger.
CHALLENGER That's okay on ACCEPT and I'm going POO.
CAPCOM Okay, your computer, the uplink sent.
CHALLENGER Okay, we've got a tone on the upright
backup.
CAPCOM Roger.
CHALLENGER VERB 47 coming in (garble). Okay, hit
it. Okay, I got it. 240 231 569 00 that's supposed to
be. The 569 00 and 240's are the same. 569 00,
Okay? Okay, 254 is front. 01944. Okay. Okay, 262 is minus
00143. Okay, 400 plus 3, and I'll watch it. How's it look?
Okay.
CAPCOM It's had that all the way along (garble).
CHALLENGER Roll by it. That's good. 400 plus 1.
400 plus 1 is in. Okay, and we do have your needle. We do
have your needle, Okay? Okay, and there's VERB 83 looking
at you. Our cross motors are low mode for you. Okay,
and there's VERB 83. Give me a 317 and a 440.
CAPCOM Challenger, Houston. We'd like you to
try the high-gain once more. Pitch is minus - pitch is
0 and yaw plus 59.
CHALLENGER You happy with this, Jack?

END OF TAPE

CHALLENGER Are you happy with this Jack?
CHALLENGER Let me see -
CHALLENGER I want to get the 63.
CHALLENGER Yeah. Go ahead.
CHALLENGER Okay. That's good.
CHALLENGER Gordy, understand no NOUN 68 prior to
P63, you're 969, right?
CAPCOM That's affirmative.
CHALLENGER (garble)
CHALLENGER You need to ask him anything. I'll try to
high-gain.
CHALLENGER No, go ahead try it.
CHALLENGER Going to high-gain, Gordy.
CAPCOM Okay.
CHALLENGER Okay, it's locked up in auto.
CAPCOM Roger.
CHALLENGER And, Gordy, be advised that you're clipping
on your first words.
CAPCOM Okay, Jack. We'd like you to set 410
in the AGS to all balls. Plus all balls.
CHALLENGER That's 410, 410 not 400.
CHALLENGER Check that again.
CAPCOM That's affirmative 410.
CHALLENGER Thank you Gordy. You better go back and check
400 now.
CHALLENGER It's okay. I fixed it.
CHALLENGER Okay.
CHALLENGER Oh, man. Are we down among them babe. Whooh!
(garble)
CAPCOM Challenger, Houston. I have a PDI TIG update.
It's 112495187. And NOUN 61 cross-range should be a plus 2.8.
Over.
CHALLENGER Okay. Say the seconds again on the PDI.
CAPCOM PDI seconds are 5187. Over.
CHALLENGER Okay. And the cross-range.
CAPCOM Cross range is 0. Down range is a plus 2.8.
Over.
CHALLENGER Okay, Gordy. That clock checks with our
time on the P63. The landing rate our breaker's in I've got
altitude velocity hour, we're coming up on 4 minutes.
CHALLENGER I'll give you the final trim at 4.
CHALLENGER Okay.
CAPCOM Challenger, Houston. You're go for PDI.
CHALLENGER Oh, thank you, Gordy.
CHALLENGER We are GO up here for PDI during the final
trim at 4.
CHALLENGER Hello, America. Do you read Challenger?
CHALLENGER That's a good one, I'll go ahead and get it.
CHALLENGER Hey, Jack, did you check your watch?
CHALLENGER Okay.
CHALLENGER At 2 minutes I'll get the master arm.
CHALLENGER All right.

CHALLENGER In 30 seconds I'll get the engine arm and we'll watch the PGNS tape meter pick up average G. If you'll give me an ullage, I'll back up the ullage.

CHALLENGER Okay.

CHALLENGER And I'll back up the start.

CAPCOM Challenger, should we lose the steerable we'll go forward OMNI.

CHALLENGER Roger. Forward OMNI.

CHALLENGER (garble) down a little bit.

CHALLENGER Okay, 241.

CHALLENGER There, we picked it all up.

CHALLENGER Power still good.

CHALLENGER Okay, coming up on 2 minutes, I'm changing over here.

CHALLENGER Okay.

CHALLENGER Master arm on in 2 minutes.

CHALLENGER Okay. Houston 2 minutes. Master arm is on. I've got two good lights.

CAPCOM Roger.

CHALLENGER Both sides of PNGS.

CHALLENGER Okay.

CHALLENGER Once again an average G. I'll get the engine arm. If you'll confirm the ullage, I'll get the PRO, I'll back up the ullage and get the start.

CHALLENGER Roger.

CAPCOM Challenger, we're going to leave BAT 3 on until after ignition. We'll call you.

CHALLENGER (garble) auto.

CHALLENGER Roger.

CHALLENGER Yeah, I should have put that on like we talked about.

CHALLENGER Man, I'll tell you we are getting close.

CHALLENGER Looking out your window is really strange.

CHALLENGER (Laughter). From over here.

CHALLENGER One minute Houston, We're standing by. We're GO for PDI.

CAPCOM Roger. You're looking good here.

CHALLENGER Okay, approaching 30 seconds blank the DSKY. DSKY blank. Average G, got 2 lights. Okay engine arm is descent I think the tape meter drove I'm not sure. Affirm the ullage, standing by for ullage. 10 seconds. Fuel ullage. We've got ullage, procede on the 99. It took 2, 1, 0 IGNITION. IGNITION Houston. Attitude looks good. Engine override is on, master arm is off. We got a descent quantity light on at IGNITION. Just prior to IGNITION.

CHALLENGER (garble) DPC tanks good. RCS is good at 15 seconds.

CAPCOM Roger.

CHALLENGER RCS is golder. Should be stable throttle up. Stand by (garble)

CHALLENGER (garble) light is on Houston. And the computer likes it.

CAPCOM Roger.

CHALLENGER Still got the quantity light on.
CHALLENGER Okay, attitude looks good Jack.
CHALLENGER Okay. At 30 seconds. Should have about 108.
CHALLENGER Oh boy.
CHALLENGER AGS and PGNS are closed. Okay, coming up
on 1 minute. One minute you ought to have 98. Okay, H-DOT is
high right now. I'll MARK it one minute. Altitude's high.
CAPCOM Challenger, Houston. I have a 169, plus 03400
plus 3400 feet. Over.
CHALLENGER (garble) looks good Houston.
CHALLENGER You're looking at it. Okay 3400 I confirm.
CAPCOM Challenger, you're GO for enter.
CHALLENGER Roger. GO for enter. At 1:30 we're GO
coming through 57 K.
CHALLENGER Okay, the altitude's high and the H-DOT is
high, That's right.
CHALLENGER Okay. At 1 - 2 minutes you ought to have
89 on the Ball. We're still 30 feet per second high in H-DOT.
But, we're about 8000 feet high.
CAPCOM Challenger, Houston. We'd like you to cycle
the PQGS switch OFF and then back on.
CHALLENGER 7000 feet. Okay Houston, coming up on 2
minutes.
CHALLENGER Okay. It's off. And it's back on. Quantity
light is out.
CAPCOM Roger. That should be good now.
CHALLENGER And Houston we - Okay, we have engine thrust
and commanded thrust full-scale high.
CAPCOM Roger.
CHALLENGER Man, that looks good.
CHALLENGER Okay, Babe, let's check them at 2:30.
CHALLENGER RCS looks good. 2:30 I'm about 89 degrees.
CHALLENGER Cabin looks great.
CHALLENGER To 515. 89 is great. We're catching up on
our altitude. We should start dropping H-DOT here a little bit.
AGS and PNGS are together. AGS has a little bit out of plane
and we're north. Has us north of track.
CAPCOM Challenger, Houston. You're GO at 3.
CHALLENGER Houston, we're up to 3 minutes we're GO and
we're out of 49 K. Roger. Understand we're go.
CHALLENGER Okay. At 3 minutes.
CHALLENGER 82's your Ball number. We're still looking
for the right altitude so our H-DOT is high.
CHALLENGER Okay.
CHALLENGER The day of reckoning comes in 4 minutes Jack.
CHALLENGER Got the weight building up, and looking
good. Attitudes are good. Okay, at 3:30, you ought to have 79
and it's right on. We're still a little high about 2500 feet
H-DOT is still high. The tape meter moves in spurts and jerks
both on altitude and altitude rate.
CAPCOM Challenger, Houston. You're GO at 4 minutes.
CHALLENGER Yep. ED BATS are 37.2.
CAPCOM ED BATS are 37.2

APOLLO 17 MISSION COMMENTARY 12/11/72 CST 13:36 GET 112:43 MC-402/4

CHALLENGER ED BATS ARE 3 -
CHALLENGER Okay.
CHALLENGER Okay, Gordo, Yaw coming at 340.
CAPCOM Roger.
CHALLENGER And the radar lights are out. Beautiful.
CAPCOM Okay, sounds great. Both systems are GO.
Right on the line.
CHALLENGER You're looking at DELTA H.
CAPCOM And you're GO for a VERB 57.
CHALLENGER Okay, VERB 57 is in. Hey Houston, is the AGS
out-of-plane, correct?
CAPCOM Stand by.
CHALLENGER Okay, coming up on 5 minutes, Jack let's
take a check at it. About 74 degrees.
CHALLENGER That's good.
CHALLENGER 70 feet per second we're coming down (garble)
CAPCOM Challenger you're GO in 5 minutes, looks
okay to us.
CHALLENGER Down at 30.
CHALLENGER Okay. GO at 5. We're out of 365 now. We've
got the Earth right out the front window.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/11/72 CST 13:48 GET 112:55 403/1

CHALLENGER We're about at 36.5 now, we got the earth right out the front window.

CAPCOM Challenger, Houston. Battery 3 on at your convenience.

CHALLENGER Battery 3 is on.

PAO 53 miles to landing.

CHALLENGER Gordo, we're GO, we're on 74 73 34, we're right on altitude, the H-dot ought to start dropping off. Except we want to keep it high, we're allowed 2 quick looks out the window, one now and one when we pitch over. I can't see a thing except the earth, that's what I'm tellyou to look at. Oh, there's the old earth. Okay, Houston, coming up on 6 minutes, 6 minutes, you ought to have 72 on your ball.

CAPCOM Challenger, you're GO (garble)

PAO Forty miles till landing.

CHALLENGER Just great, H dot great, AGS and PNGS are very close, couple feet per second difference.

CHALLENGER Okay.

PAO Thirty one thousand feet altitude.

CHALLENGER We went over the hump, delta H just jumped.

CAPCOM Roger.

CHALLENGER And looks like it's back down.

CAPCOM Roger, sounds good.

CHALLENGER 68, Geno.

CHALLENGER Looks good babe, 72, altitude is right on, H dot is very close.

CHALLENGER Okay, 32 your AUTO zero.

CAPCOM Throttle down time 7 plus 26.

CHALLENGER 7 plus 26.

CHALLENGER Okay, we got everything - we're at YAW 0.

CHALLENGER Okay, it's 7 minutes, 67 is your angle, 2627, that's great (garble)

CAPCOM Challenger, you're go at 7.

CHALLR H dots slightly high, but okay.

CHALLENGER Okay, Gordo, we're go at 7, we're now at 25 000 feet. We're quite a bit out of the command module plane, but I guess we're on target. Okay, watch the throttle, now here it comes.

CHALLENGER Throttle down at 27, the computer likes it. Beautiful.

CAPCOM Roger.

CHALLENGER Okay, 730, 145 to pitchover, Jack.

CHALLENGER Okay, 53 is your angle, about 56 now.

CHALLENGER Okay, that's getting closer.

CHALLENGER H dot and H are great.

Standing by for the camera. Houston, we're go coming up on 8.

CHALLENGER Okay, the old camera's on Gordie, believe it or not.

2. CAPCOM How about that, you're at 8, monitor fuel

PAO Ten miles to go.

CHALLENGER Fuel 2, 27 that's good.

CHALLENGER Come on baby.

PAO 18 000 feet.

CHALLENGER Peak 30, Geno.

CHALLENGER Okay, I've got the South Massif.

CHALLENGER Okay, update the AGS, Houston, (garble)

CAPCOM That's affirmative, update the AGS.

CHALLENGER Okay, Gordo, I've got Mansen, I've got Lara, and I've got the Scarp.

PAO 5 miles to landing.

CHALLENGER We're level with the top of Massif, now.

CAPCOM Roger.

CHALLENGER Okay, 151, 1510 enter, okay Jack (garble)

CHALLENGER We're pitching over.

CHALLENGER Okay, Gordo, we're out at 11 000 at 9.

Okay, standby for pitchover. Oh, are we coming in. Oh baby.

CHALLENGER (garble) 9000, stand by for pitchover

Jack.

CHALLENGER 8000.

CHALLENGER I'll need the probe.

CHALLENGER Okay, I'll give it to you.

CHALLENGER Pitchover proceeded.

CHALLENGER Okay, there it is Houston, there's Camelot, right on target. I see it.

CHALLENGER We got them all.

CHALLENGER Forty two degrees, 37 degrees through 5500, 38 degrees.

CAPCOM Challenger, you're GO for landing.

CHALLENGER 42 degrees through 4000 47 degrees through 3500, 49 degrees, 3000 feet, 53 degrees, okay, I've got Popy, I've got the Triangle, 2500 feet, 52 degrees, H dot is good, at 2000, H dot is good, fuel is good, 1500 feet, 54 degrees, Gene, approaching 1000, approaching 1000 feet, 57 degrees, okay you're through a thousand and I'm taking radar altitude and PNGS altitude degree, we're through 800 feet, H dot is a little high, I don't need the numbers anymore.

CHALLENGER Okay, you're 31 feet per second and going down through 500, 25 feet per second through 400, that's a little high, Gene.

CHALLENGER Okay.

CHALLENGER 300 feet, 15 feet per second, a little high, H dot's a little high, okay I've got P56, 9 feet per second down at 200, going down at 5, going down at 5, going down at 10, cut the H dot, the fuels good, 110 feet, stand by for some dust, little forward, Gene, move her forward a little, 90 feet, a little forward velocity, 80 feet, going down at 3. Getting a little dust, we're at 60 feet going down about 2, very little dust, very little dust, 40 feet

CHALLENGER going down at 3, stand by for touchdown.
Stand by, 25 feet, down at 2, fuels good, 20 feet, going down
at 2, 10 feet, 10 feet, contact, stop push, engine stop, engine
arm, proceed, command override OFF, mode control at hold, PNGS
auto.

CHALLENGER Okay, Houston, the Challenger has landed.

CAPCOM Roger, Challenger, that's super.

CHALLENGER Okay, parker valves -

CHALLENGER Boy, you bet it is, Gordo.

CHALLENGER Boy, when you said shut down, I shut
down and we dropped, didn't we?

CHALLENGER Yes, sir, but we is here, man is we
here. How does that look?

CHALLENGER Pressures look great, tank 2 is down just
a little from before, engine override is OFF, manifold is
great, manifold is right on, Go to jets.

CHALLENGER Okay, I am jets.

CHALLENGER Okay, that sides complete. Houston,
you can tell America that Challenger is at Taurus-Littrow.

CAPCOM We'll do it.

CHALLENGER Great. Ron, I had the meatball all the
way. Beautiful. Jack, are we going to have some nice
boulders in this area. Okay the old cameras off.

CHALLENGER Okay.

CHALLENGER Landing radar breaker, OPEN. Checking
the water. And Gordie, ascent tank 1, we started out a
little low, it's still at the same place, that's water.

CAPCOM Roger, Jack.

CHALLENGER Batteries look good.

CHALLENGER Oh, man. Look at that rock out there.
Absolutely incredible. Absolutely incredible. I think I
can see the rim of Camelot.

CAPCOM Roger.

CHALLENGER Greatest moment of my life.

CHALLENGER Where'd you land?

CHALLENGER You never let me look outside at all.
Hey, you can see the boulder tracks.

CHALLENGER Okay, Gordie, we're standing by for
your GO, we're looking good onboard.

CAPCOM Okay, you're looking great here so -

CHALLENGER Man, there's boulders all over those
Massiffs. Man, look at that propellant, we could have gone
all around and looked around.

CHALLENGER We should have hovered around a little
bit, gone and looked at the Scarp.

CHALLENGER No, thank you. I like it right where
we are.

CHALLENGER Okay, Gordie, while you're waiting on
that GO, I had to - I shot for a spot, around 2 o'clock from

CHALLENGER Poppy. There are a number of boulders out at 12 o'clock from Poppy and I really think I'm probably not more than about 100 meters out in front of it, and slightly to the north. Actually, I may be a little bit closer to Trident than I expected Poppy to be. I think I've got Trident right out the left window. And our first cut at the mobility around here in the Rover ought to be super.

CAPCOM Okay, sounds good.

CHALLENGER But I tell you, the Massif and Bear Mountain are 2 different products. They look it, don't they? Of course, they're different slopes, too. I think you're looking - probably, that may be Rudolph, right there, Jack, out your window.

CHALLENGER I was looking more at those boulders and trying to stay in the spots in between them than I was in relationship to that crater.

CHALLENGER Yes, you did great. And there was practically no dust, just a little bit of a film, you had the ground, all the way to the ground.

CHALLENGER Yes.

CHALLENGER I could call touchdown on the Shadow. Look at that.

CHALLENGER Really here. (laughs)

CHALLENGER Okay, Gordy, we're hanging in for your Go.

CHALLENGER It better be a GO.

CHALLENGER I'll check everything again. Let's just double check. Okay. That hasn't changed.

CHALLENGER It looks good.

CHALLENGER The manifold hasn't changed.

CHALLENGER The RCS hasn't changed.

CHALLENGER Ascent water hasn't changed. The batteries haven't changed.

CHALLENGER Oh, my golly, only we have changed.

CHALLENGER You know, you can't see into Camelot, Jack, that rim is Camelot out in front of us.

CAPCOM You'll be glad to hear your stay is for T-1.

CHALLENGER Okay.

CHALLENGER America, we have a stay for T-1.

CHALLENGER Gordy, you're a smooth talker.

CHALLENGER Stay for T-1.

CHALLENGER Okay, let's find out where we are.

CHALLENGER Engine stop is reset.

CHALLENGER The AGS is ready for us if we need it.

CHALLENGER Okay, I need a P-12 time as soon as I get

60 (garbled)

CHALLENGER Okay, Gordy, you're looking at NOUN 43.

CHALLENGER Copy that down, Jack, right here.

CAPCOM Okay, we've got it.

CHALLENGER 20 21 and 30 75 and I'm going to P-12.
Okay. I need a P-12 time from you.

CHALLENGER Okay. For T-2 the time is 113 14 2491
491.

CHALLENGER Yes.

CHALLENGER I can't feel any difference between one-
sixth g and anything else right now.

CHALLENGER Well, you still have your restraints on.
(laughing)

CHALLENGER Okay. 113 142491. Are you happy with that.

CHALLENGER That looks good, sir.

CHALLENGER Okay. I gotta change these numbers?

CHALLENGER You didn't get an update on NOUN 76 did you?

CHALLENGER I don't think so. No.

CHALLENGER Okay.

CHALLENGER No. Okay, 5515. Hello, Gordy, how would
you like me to handle R3 of NOUN 76?

CAPCOM Standby, I'll come back to you.

CHALLENGER Okay.

CHALLENGER That radar performed super.

CHALLENGER How was the view on the way down, Gene?

(laughing)

CHALLENGER You know after we pitched over I was just
looking for a place to land. And I'm not sure. I just didn't
want to hit one of those boulders out there which would have been
- look at that. Look right in front of us. I didn't want
to land there either.

CHALLENGER I see that one right in front of us.

CHALLENGER See that. That's a boulder.

CHALLENGER That's a hole.

CAPCOM Challenger, Houston. R3 south range is
okay as is.

END OF TAPE

CAPCOM R3, South range is okay as is .

CHALLENGER Okay. Okay, we're coming up -

CHALLENGER - we're in posture for a T-2, Gordy. Okay I can see the Scarp, I can see Hanover, good thing we didn't plan to go to Hanover, it's steep. Look at the boulder tracks half way up the hill. Yeah, there not halfway just enough.

CHALLENGER Yeah, they're boulder tracks, they're beautiful.

CHALLENGER It's sitting right there in the end of the tracks. There's tracks all over that hill side. There's a boulder came right down to the surface, see it, that one right through that little crater -

CHALLENGER Yeah, sitting right there for us to sample. Look at it. Yes sir. I'll bet Bear Mountain and the Sculptured Hills, are the same.

CHALLENGER Yeah, well the slope's different, we'll have to look at it from outside, you may be right.

CHALLENGER Now I see why they call them sculptured. They're so hummocky that there's shadows all over them.

CHALLENGER Yeah, there's some holes and rocks around here who told me this was a flat landing site?

CHALLENGER It is flat. For crying out loud what do you want, an air tight guarantee? Let's see, we got about 2 degrees left and about 5 degrees pitch up.

CHALLENGER We're about what - about 100 meters from Irident?

CHALLENGER Yeah - yeah, less than that, I think Irident's right here.

CHALLENGER Our shadow's about 100 feet, Geno, I think.

CHALLENGER Yeah, we're only about - yeah less than 100 meters then. It doesn't look that long but it -

CHALLENGER There's some holes I'm glad I didn't land in around here, I'll tell you.

CHALLENGER Now, if you look at the Massif, Jack, I don't know if you can see it over here, you see, there almost like a series of linear boulder tracks, but they come cross-ways down the slope, so it looks like there may very definetly be some - some jointed - there's outcrop on top the Massif.

CHALLENGER Oh, it sure looks like it, grey outcrop.

CHALLENGER And there's a bluish grey compared to the brown or tan grey of the Massif side, and a lot of that boulder is a lot of that outcrop down on the bottom is boulders.

CHALLENGER Yeah, do you know what that reminds me of way up on top - that outcrop? That reminds me of sunset where you could just get a little piece of outcrop around the corner. That's right.

CAPCOM And America have pan camera photo pad, are you ready for it? It'll go on page 129.

CHALLENGER Okay, let's see what we're doing, we got 3 minutes for G-2, let's take another check.

APOLLO 17 MISSION COMMENTARY 12/11/72 14:01 CST 113:10 GET MC-404/2

CHALLENGER Okay, I just looked at 'em.
CHALLENGER Okay, SF looks good.
CHALLENGER Gordy, I noticed something every since we've
landed, the oxidizer quantity went from - from 7 or 8, and not
it's down to 2 and the fuel has stayed constant.
CAPCOM Roger.
CHALLENGER And the quantity light came on somewhere I
believe after we landed. Yeah it did.
CHALLENGER I noticed the quantity light also, I was
thinking reg light though when I saw it. Oh man.
CAPCOM Challenger, we'll have a story on that for
you later, we don't think we were really low level.
CHALLENGER Okay, it doesn't make any difference now
Gordy, except to talk about when we get home.
CAPCOM Roger.
CHALLENGER And we're 2 minutes and counting to T-2.
CAPCOM Roger.
CHALLENGER We better hurry if - they're going to give
us the go.
CHALLENGER How about some water?
CHALLENGER Yeah, you can zap me.
CHALLENGER Oh, I tell you, that's something everyone's
got to do once in their life. I want to -
CHALLENGER We're not going to have much time for T-2 -
CAPCOM Challenger you're stay for T-2 and go for
the DPS vent.
CHALLENGER Okay.
CHALLENGER Okay, and stay for T-2 and go for the DPS
vent.
CHALLENGER Let me get out of - okay we can't hack that,
I'm going to get out at 12 2's good.
CHALLENGER Okay, you can unzip that water, if you'd like
and let's go off VOX, let's go on PTT.
PAO This is Apollo Control. We mark the unofficial
landing time at 113 hours 1 minute, 52 seconds ground elapsed
time. And, from the description, the unofficial landing site is
about 100 meters beyond the crater Poppy -
CHALLENGER Houston, oxidizer fuel vents coming open.
CAPCOM Roger.
CHALLENGER Master arm on, master arm's coming on.
CHALLENGER Hey, Gordo, I got 2 good lights.
CAPCOM Rog.
CHALLENGER Detent vent fire.
CHALLENGER Okay MARK it, now we did not hear anything on
that one Gordy.
CAPCOM Roger.
CHALLENGER Pressure's coming down though, pressure's coming
down. Okay master arm OFF. Okay we'll monitor oxidizer pressure
20 to 40 and then OX vent CLOSED, fuel pressure to ACTIVATE
fuel vent Descent quantity lights, reg light, excuse me.
CHALLENGER Okay, mode control 2 to att hold, well
we can keep going I guess.

APOLLO 17 MISSION COMMENTARY 12/11/72 14:01 CST 113:10 GET MC-404/3

CHALLENGER Yeah, hey, we can press on. Okay.
Okay now wait a minute, here we go, let's get that, go up here
first, because I haven't selected it.

CHALLENGER Okay, ECA control is CLOSED, three is back on,
battery 5 is OFF reset and it's off the line, battery 6 off reset
and it's off the line, burner number 2, breakers in, burner 2,
let me check the voltage, voltage is great. Okay, keep going.

CHALLENGER Descent engine override's OPEN. Ascent ECA's
controls OPEN; (garble) cycling, cycled, both lights are out. Okay,
cabin pressure is good, okay and then A and B going to CABIN, A is
to CABIN, B is to CABIN, full egress, return is EGRESS, repress
going to AUTO. Stand by for a noise, there you go it's in AUTO.
Okay, now it's your turn.

CHALLENGER Verified. Wonder where it's going, out I
guess.

CHALLENGER Burner 2 is selected.

END OF TAPE

CHALLENGER (garble) power, open. Guess what?
Take your helmet and gloves off.

CHALLENGER Okay, Gordy, we're in 1-1. Helmets and gloves are off. Converter valves are IV.

CAPCOM Okay. We're right with you.

CHALLENGER And you're looking at NOUN 20.

CHALLENGER (garble) shades are going closed.

CHALLENGER I just - I'm using it instead of a light switch because I've got to cover it up.

CHALLENGER Gordy, You got NOUN 20?

CAPCOM That's affirmative. We copy NOUN 20.

CHALLENGER Okay, Jack, you want to pick up the AGS on the right side of the page and I'll park the antenna.

CAPCOM Roger.

CHALLENGER P20 did work. Correction, P57 did work.

CAPCOM Challenger, Houston. You're DPS oxidizer pressure is 40 or less. You can close it.

CHALLENGER Thank you, Gordy.

CHALLENGER Gordy, while the P57 is doing it's gravity work, let me say that the LNA and the landing site, from a relief point of view, I think are identical. I couldn't say enough for the LNA. I actually didn't look around nearly as much as I thought I would, or as I wanted to because I had fixation on a reasonable spot to land. They're not all reasonable in that - there's some very subtle hummocky like craters right in and around where we are and there's not a - a lot of boulders laying on the surface but there's a lot of what appear to be boulders that are covered up by some of the dark mantle - numerous enough that you would not like to take a chance at putting a - a pad down on one of them or in one of those hummocky subtle craters. As a result, I really didn't have a chance to look all around at where I wanted to except to put the bird down where I wanted it.

CAPCOM Okay, we've got no complaint with that.

CHALLENGER I guess the thing that probably - probably surprised me most about the site as far as landing is concerned is the fact that there were these - these - I hesitate to say they're outcrops but certainly they're buried massive pieces of rock, whether they're boulders or not we'll have to find out. Out here in the plains area, partially covered and fillited by the dark mantle. And I expected to find a number of craters but I guess I really didn't expect to find - to find the - the rock types around

CHALLENGER and we're talking about anywhere from 1 to 2 meters down to oh 2 or 3 feet which when their sticking out and on the sides of some of these subtle craters look pretty menacing. But, that's probably the one thing that surprised me the most.

CAPCOM Roger, Gene.

CHALLENGER The visibility prior to pitch over was such that I could see Nansen. I could see the scarp I could see Lara. I could not see Camelot until after pitch over. However, once I had pitch over if I might could have froze it right there like we did a simulator occasionally. I could have picked out everything there was to see. Even at 6 000 feet the small triangle with Frosty and Rudolph and Punk were visible to me. I had Poppy from orbit as a matter of fact so it was easy to see. Barjea was a very sharp round crater just as depicted on the LNA. The thing I really didn't get a good look at because I didn't pay too much attention to it was Trident on to the South.

CAPCOM Roger.

CHALLENGER Gordy, this is the LMP. Let me say - Gordie this is the LMP let me say that the inside of the spacecraft looks just like the simulator.

CAPCOM Very good Jack.

SC Another interesting thing, Gordy. All the way through PDI prior to pitch over Jack and I had the real America or the other America right out smack out the front window all the way down which was pretty spectatular.

CAPCOM I bet it was and you can consider yourself stay for T3.

SC Thank you sir, your getting smoother all the time. If your happy with NOUN 22 I'll pro.

CAPCOM Stand by 1. Your clear to pro.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/11/72 14:20 CST 113:29 GET MC-406/1

CHALLENGER Okay, Gordy, I had the angles matched on the steerable and went to slew and they - and it held for a few seconds and then dropped off.

CAPCOM Okay. It looks pretty good. You might try to peak it up just a little more.

CHALLENGER No, we're on an OMNI now.

CAPCOM Rog.

CHALLENGER I'll try the steerable one more time here.

CAPCOM Okay -

CHALLENGER Okay, we're on the steerable and I'm not going to touch it.

CHALLENGER It's steerable and slew, and I got 3.8.

CAPCOM Okay, that looks good to us, Jack.

CAPCOM Jack, we'd like you to verify the tape recorder off.

CHALLENGER That's verified, Gordy.

CHALLENGER Gordy, how did the fuel vent look to you?

CAPCOM Okay, looks like 8 to us, you can go ahead and -

CHALLENGER Anyway - okay, I already did.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/11/72 14:30 CST 113:39 GET MC-407/1

CHALLENGER Gordy, I guess I'm puzzled on that one, I had the right star. You see anything we did wrong.

CAPCOM Stand by we're checking.

CHALLENGER Gene, our only guess in that you might have loaded NOUN 88 wrong, we'd like you to start over, and we'll watch you real close again.

CHALLENGER Gordy, listening, I think we know what we did, we load Sprial for Cursor and Cursor for Spiral. How would it be if we went through the P57 again and yeah - we'll - I guess we got to do it all over, those old numbers are no good any more.

CAPCOM Okay.

CHALLENGER I - I'm sure that's what we did, we loaded Cursor for Spiral and Sprial for Cursor.

CAPCOM Okay, it's our fault too, we should have watched that.

CAPCOM Jack, this is Houston, we do have the pre-PDI AGS cal numbers, you won't need to read them to us.

CHALLENGER Okay.

CHALLENGER Gordy, you don't want a recycle on this gravity measurement, I doubt if it will need it.

CAPCOM Stand by. No, no recycle necessary this time through.

CHALLENGER Okay.

CHALLENGER Gordy, ED batts are 37.2.

CHALLENGER Gordy, let me comment about the handling of the bird, after you once fly it around in orbit, you get accustomed to the thrusters, and it came back to me quite a bit from 10 anyway, and you get a feel for acceleration and deceleration as well as the attitude hold capability, and it really - the response, even with a heavy descent - descent stage near, it's phenomenal, it responded exactly in the direction I wanted, held attitude very good, and let me tell you the LLTV plays no small part in this landing as far as I'm concerned.

CAPCOM Roger, Gene.

CHALLENGER Okay, NOUN 22 again, I'm going to torque them.

CAPCOM Okay, go ahead.

PAO This is Apollo Control at 113 hours 44 minutes ground elapsed time in the mission of Apollo 17. Some refined numbers on the landing site for Challenger: In degrees minutes and seconds, the latitude has been pinned down to 20 degrees 9 minutes 50.5 seconds north, longitude 30 degrees 46 minutes 19.3 seconds east, which is about 639 meters east of the designated landing point -- the premission landing point. For those newsmen who have the landing site with the grid coordinates on it, that corresponds to DN.0 by 84.2. At 113:45 Ground Elapsed Time, this is Apollo Control.

END OF TAPE

PAO This is Apollo Control at 113 hours, 48 minutes ground elapsed time. We're estimating a change of shift, if you will Press Conference, with the landing team flight director, Gerry Griffin, in the small briefing room at 3:00 PM. To repeat estimated Press Conference in about 20 minutes, approximately, 18 minutes to be exact, in the small Briefing Room in Building 1. Some 42 minutes away from acquisition as the Command Module, America, comes around on revolution 14. Meanwhile on the surface, to repeat the estimated landing site. It is right down the line on the Ground Track. However some 369 meters east or short of the predesignated, premission landing point.

CHALLENGER A little better.
CAPCOM Rog. Looks good.
CHALLENGER Computer is now N 93.
CAPCOM Okay, Torque it.
CAPCOM Challenger, Houston. We're standing by -
CHALLENGER Okay Gordy, I'm ready to give aim in.
CHALLENGER Coming at you.
CHALLENGER MARK it, it's on the way.
challenger Gordy, one other thing about the landing. I saw the light. I think, I heard Jack call it, - the contact light. I think I waited about a second and hit the stop-button she shut down immediately, and of course, you could feel the fall. I don't really feel we fell that much but it was quite a change in acceleration at that point.
CAPCOM Roger. Gene.
CHALLENGER And I guess I had, what I would guess a foot or 2 persecond forward on that one.
CAPCOM Okay. Sounds good.
CHALLENGER And, let me know when I can have the computer, please.
CAPCOM Okay, it's your computer and I'm standing by with marking angles when you are ready to load them.
CHALLENGER Okay, we'll be ready in a second.
CHALLENGER Go ahead with the angles.
CAPCOM Okay, these are the IMU parking angles. Plus 29586. I see you loading the radar. Do you just want to load these or write them down?
CHALLENGER Go ahead I'm writing.
CAPCOM Okay. Y will be plus all 0s. And plus 08414. Over.
CHALLENGER Okay. Noun 20 will be plus 29586, plus all 0s, plus 08414.
CAPCOM That's correct.
CHALLENGER Okay, Houston. I'm going to power down the AGS, if you're willing.
CAPCOM Not yet Jack, we'd like you to readout 047 and 053 to us.
CHALLENGER Okay. You want the new ones - - Okay, Gordy, if you're happy with NOUN 22, I'll enter them.

APOLLO 17 MISSION COMMENTARY 12/11/72 CST 14:40 GET 113:49 MC-408/2

CAPCOM We're happy.
CHALLENGER Okay, and it just dawned on me, I'm
sorry about the 0 on that NOUN 69. (Chuckle)
CAPCOM That's okay, you're forgiven.
CHALLENGER I appreciate that. (Garble)
CAPCOM Okay, Jack. We got 47 and 53.
CHALLENGER Okay, am I GO to pull the breakers?

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/11/72 CST 14:50 GET 113:59 MC409/1

SC Okay. Are you happy with NOUN 20?
CAPCOM (Garble) we're happy with NOUN 20 and you're
clear to power down the AGS.
SC Okay.
SC Gordie, the breakers are coming open on 14
and 15.
CAPCOM Roger.
PAO This is Apollo Control. To repeat, there
will be a change in shift press conference with the Flight
Director, Gerry Griffin, in the small briefing room in approxi-
mately 5 minutes. At 114 hours 1 minute Ground Elapsed Time,
this is Apollo Control.
SC Gordo, we're on 1 dash 6.
CAPCOM Okay, thank you.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/11/72 CST 15:00 GET 114:09 410/1

PAO This is Apollo control at 114 hours
11 minutes ground elapsed time into the mission of Apollo 17.
Commander Gene Cernan's heart rate during the descent and
landing ranged from 102 average during the descent portion
of the landing to 128 at actual touchdown. There is a change
of shift briefing that will start momentarily in the small
briefing room in building 1. We'll take down the broadcast
line at this time and tape any conversation during that period
and play it back at the conclusion of the briefing which
starts now. This is Apollo control out.

CAPCOM

By 428 - -

END OF TAPE

PAO This is Apollo Control at 114 hours 36 minutes ground elapsed time. During the just ended Press Conference of the off-going flight director Gerry Griffin, some four minutes of air-to-ground tape with the crew of Challenger has been accumulated, compressed somewhat from the actual real-time. That four minutes of tape will be played back and we'll rejoin the conversation with the Crew of Challenger at Taurus Littro Landing Site at the conclusion of that tape. Roll the tape.

CHALLENGER Okay, Houston. We're at the bottom of 1-8, and I'm standing by for your lift off time.

CAPCOM Okay, Jack. Liftoff time for REV 15, is 116:55:51. 16, is 118:54:5:28, 120, 53, 04, 122, 51,40, 124, 50, 17, 126, 48, 53. Over.

CHALLENGER Okay. Starting with REV 15, 1165551,118 5428,1205304, 1225140, 1245017, 1264853.

CAPCOM That's a good readback.

CHALLENGER Gordo, the PLSS is against the hatch and we're installing the BRA.

CAPCOM Roger, on that.

CAPCOM Challenger, Houston. We've got 3 questions for you to help pin down your exact position, any time it's convenient, maybe when you're taking the out the window pictures. Over.

CHALLENGER Okay, Gordo. I think we can give it to you, why don't you wait. We're just getting the (garble) bag out and jett bags out from behind the engine cover here, to give you an idea where we are.

CAPCOM Okay, no hurry at all.

CHALLENGER I had it pinned down for you until I got to about 500 feet when I changed my mind.

CAPCOM Roger.

CHALLENGER Gordy. We're not going any further. We'll answer your questions here when we get some time. My best guess is 150 meters, from Poppy at one to two o'clock.

CAPCOM Okay, we copy that.

CHALLENGER And, I'll bet on that one, but we'll get with you in a minute.

CAPCOM Okay, 150 northwest of Poppy.

CHALLENGER Yeah. Mostly west. But slightly north.

CAPCOM Roger.

CHALLENGER I'll tell you the, we're abeam I think, just about abeam of Trident 1. I can see it out there, but I can't really define Trident 1 from Trident 2. And the thing that is a little different is that I appear to be closer to it than I normally would have expected to be.

CAPCOM Okay.

CHALLENGER That's probably as close as the Navy Captain could ever guess where he is anyway.

CAPCOM Rog.

CHALLENGER Okay, Houston. We're just starting our eat-period. It's going to be a little behind, DRD readings are 17037 and LMP is 24117.

CAPCOM Okay, Jack. We got that.

CAPCOM Would you verify your biomed right.

CHALLENGER Yeah, that's verified. How does it look?

CHALLENGER Looks good.

CHALLENGER Okay, Gordy. We're starting to cut into a little lunch here and if you've got any questions, why don't you come up with them now.

CAPCOM Okay. We're wondering if you can - - wondering if you can give us estimate of the angular position, clock position of Rudolph. And can you line up Rudolph with a horizontal feature out beyond it.

CAPCOM I should say horizon feature - out in the distance, not horizontal.

CHALLENGER Okay. I thought Rudolph was right out there at 3 o'clock. Jack's looking at it and he said yes, that is Rudolph right at 3 o'clock out his right hand window.

CAPCOM Okay.

CHALLENGER I don't know if it'll mean anything to you but, the shadow of the LM, the rendezvous radar antenna is pointing about 1/3 of the way down from the peak of Hadley. That I know pretty (garbled). And Gordy, I must be right here abeam of Trident 1. The only reason I hesitate is that I'm so close but, it's probably, well I guess it's close to 100 meters, 80 meters anyway, to where the rim of Trident 1 falls off. I am abeam of the center of Trident 1 and that's the only possible thing it could be. And that would put Poppy just about where I expected it to be.

CAPCOM Okay.

CAPCOM We just want to confirm. You're referring to Trident 1 as the eastern most part of Trident, is that right?

CHALLENGER No, sir, Gordy. It's always been the western most part of Trident. The landing site was on a line between Trident 1 and Rudolph and judging from what Jack's got on his right hand window and what I've got on my left hand window we're right there, except possibly a scosh further south on that line.

CAPCOM Okay, understand.

CHALLENGER And it was right up where we all had expected it to be about half way between here and what we are calling the rim of Camelot. We can't see into Camelot we can just see the rim of it. It's several, oh, at least 200 meters, 2 to 300 meters up there I expect.

CAPCOM Okay, what o'clock position is the west, the nearest part of the rim of Cam - Camelot?

CAPCOM Or maybe if it's better defined, define the south rim. Can you see the south rim of it.

CHALLENGER Yeah, Gordy, but it blends in so well, all we're seeing is a (garble) undulating high as the rim. And to the

APOLLO 17 MISSION COMMENTARY 12/11/72 CST 15:29 GET 114:36 MC-411/3

CHALLENGER best of my knowledge we've got the south rim at, or crest of the east rim right at 12 o'clock. Hey Gordy, right at 12 o'clock also is a boulder that's at least three meters and maybe five and I wouldn't be a bit surprised if you could find it. It's on a line between us at the intersection of the South Massif and the Family Moun - Mountain Horizon. Just slightly left of that line, or south of that line. And that boulder ought to show up on your best photography.

CAPCOM Okay, Jack. We'll take a look. One other question, -

CHALLENGER It's at least - That boulder's at least 200 meters away.

CAPCOM Okay. Can you see the west rim of Trident, and can you give us a clock position on the west rim of west Trident?

CHALLENGER The west rim of Trident, which by the way, is full of out cropping looking boulders, is at 10 o'clock.

CAPCOM Okay, Gene -

CHALLENGER Okay, I can look back around the corner now and I can - I - -

END OF TAPE

SC I can see where the east where Trident rose up to it's rim on the east side, and I would say we're abeam of a point - abeam of a point one third of the way from east to west up the center of Trident. That is, we covered one third of trike one and we're abeam of a point of a line that goes through the one third point from east to west of Trident one.

CAPCOM Okay, Gene that's very clear I think we've got you pretty well nailed down. And it's pretty close to the planned landing side.

SC Yes, I think it's very close to our planned landing site and I need to see where Poppy is because I think what I said earlier is true.

CAPCOM Okay, that's all the questions now. Enjoy your dinner.

SC Houston, I have calmed down, but be advised that our dinner is corn chowder.

CAPCOM Roger.

SC He went to captains mast for eating that the other day.

SC Gordie Houston, 17. How do you read, or Challenger or whoever we are.

CAPCOM Whoever you are, you're loud and clear.

SC I took the binocs and looked at some large boulders at our 12 o'clock position. There probably on the order of a half meter to 2 meters buried but without strong filleting. And, both of them that I could see had the same mottled light gray and medium gray texture and looks like there is a lineation in it. And, whatever the mottling is it's on a frame size or fragment size of a - or a few centimeters and it looks as if it's very uniform in that mottling that is there is one fragment size.

CAPCOM Okay.

SC There are a few - -

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/11/72 CST 15:50 GET 114:57 413/1

SC Have a quite of view. Near one crater out at 12:00. Dark gray rock that may be glass coated. Matter of fact one of them looks like it's right at the rim and might have been part of a projectile that made the crater.

CAPCOM Roger.

SC The large boulder that I mentioned is several meters in diameter. Not even sure it's a boulder. It does have a well developed fillet. It's highly fractured. It looks like the fracture is generally north south, at least we can't see in on into the fracture. And it's to far away to be sure, but it looks like it's modeled also. Although there did appear in the binocular to be more heterogeneous modeling. It might be a breccia.

CAPCOM Okay.

SC That boulder ought to be very close to the ALSEP site.

CAPCOM Roger.

SC Gordo. In reference to these boulders, everywhere I can see out of my left window and out ahead of me in referring to that boulder Jack's talking about which is just a little bit on my side at 12:00, it appears that the dark mantle and some of this, and for the most part covered, has covered part of or is up on top of some of the crevices and the crannies and the boulders themselves with the exception of well, I'll take that back, even the very small ones. I'd say from a population point of view, boulders of the size Jack is talking about that are visible through the surface anywhere from one to two to three meters, a very small percentage, but when you look at 'em that aren't level, it looks like they are quite populous. I'd say they're maybe about 25 of them in view between myself and the - where the horizon falls off down away from us down towards the South Massif. The area back towards Station 1 at least the other side of Trident, looks like it's more heavily strewn with some of these cylinder, the partially mantled large fragments.

CAPCOM Roger, Gene.

SC To say that there is a boulder as such, actually sitting on the surface, I can't - I really can't find one. Unless they are more around something very small and possibly younger craters. And I think for the most part everything is somewhat mantled.

CAPCOM Okay.

SC Gordy, I think maybe the predictions of a fairly thin regolith were good. Have a crater at about oh, 130 feet. It looks like it's not more than a meter deep. It's very fresh, has a bright halo around it and it's very rocky in it's interior. It has some rocks that are at least 10 or 20 centimeters in diameter on the rim. It looks like

it's penetrated into some rocky - much rockier substrate than what we're seeing on the surface. The surface itself looks like a, oh, probably 50 percent fragments greater than half a centimeter.

CAPCOM Okay, Jack.

SC I don't see any general size - I don't see any general size, Gordy. I do have a crater out here that is maybe a meter in diameter, that's fairly fresh, although not bright halo. That has not penetrated through blocky material. And it looks like that the saturation crater size is very small in the area we can see. That is there don't seem to be any old or very subdued craters, well, let me think about how to put that again. They're obviously saturated with craters a few centimeters in diameter but when you get bigger than that there seems to be more of a clear distribution rather than a saturation.

CAPCOM Okay.

SC Gordy, let me give you a quick far-horizon. 12:00 I've got Family Mountain. It's a - it and South Massif are a replica from there plate point where I am except that Family Mountain is much more symmetrical and rounds off to a very more definite peak. The South Massif in turn, has got a high plateau a high flat peak on top. My far-horizon, then at 12:00 to 11:30 is dominated by Family Mountain. It's - well, I hate to use the word unorthosite without getting out of the spacecraft, but it sure is white. It sure is white, but it is varied shades of white. Ah, with sort of a, a tendency on its southern or southeastern slopes to be sort of marble caked with a darker material much the same color as the mantle we've landed on. The Family Mountain disappears just about at the level of the rim of Camelot on my far-horizon and just, it sort of, it starts out, let's say about 11:00. It just - just there's where the top of Massif starts up, very abruptly. I'd say, well, I'll try not to over estimate, but certainly 30 degrees I'd say. Very abruptly to a very impressive altitude. I know I was at 13 000 when I said I was at their level. That it sure looked it from there. It plateaus off from about 10:30 to about 9:30 and then it starts sloping back down toward the east at about the same angle. Very symmetrical. There are several places where you can see what appear to be outcrops. I'd say several - about a dozen anyway. Where you can see relatively large areas of outcrop on the South Massif. That outcrop is a - of a darker gray color than the white gray of the Massif itself. The one most domineered - dominant on top is right at the change in slope to the west where it goes up slope and then plateaus off and there is a definite outcrop. And you can see several boulders on all levels of the Massif that have come apparently from outcrops

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and I feel certain we will be able to get to some of those that have come all the way down. South Massif too is a - appears to be in areas marbledly caked dirty, such as if they were sprinkled with a dirty or a darker covering and that covering is more evident as it slopes back here towards the east. As the far-horizon now, I can see South Massif all the way to 9:00 but then behind it there's just a little breadloaf-type dome of a much darker, much more hummocky mound back there, relatively big. It's probably, from where I stand, at least 10 percent the size of the Massif, the South Massif. Granite texture. There appear to be some lineations running, well as I look ---

END OF TAPE

CHALLENGER As I'm looking down at them their dipping down into the west at about 20 degrees, but that may be a sun angle problem. But, they are definitely there. And, then contrasting that is Bear Mountain which is also much darker gray much different than the massif where I stand much more hummocky surface appears to me to be what I would expect Sculptured Hills to be like. One other thing about the south massif is that as I look at - as I look at it at about 9:30 to 10:30 there is a little knob of the south massif that sort of flows toward the east or slightly toward the northeast that's the one that tends to be a little more heavily covered with the darker dusty material.

CAPCOM Challenger, Houston, over.

CHALLENGER Go ahead.

CAPCOM Okay, we're about 12 or 13 minutes behind the timeline for starting the cabin preps and back room is enjoying your description, but we think we'd rather you press on with preps and get ready to get out for a really good view, over.

CHALLENGER Okay, Gordie we're doing this and eating too. We're trying to do them both at the same time, and we are pressing just want to say one other thing about the massif. I can see a couple of places where craters have penetrated very small craters and penetrated the massif craters maybe a meter or two in size some five meters and there is a lot of rock debris around them which tends to believe that there is very little if any soft covering on that massif.

CAPCOM Roger.

CHALLENGER Gordie, just a couple more words about the north massif. It looks like a good distribution of boulder tracks. Many of the boulders are accessible. They are - the tracks can be traced up at least to mid slope. That's at my 3 o'clock position, and occasionally at that midslope position particularly northwest of Henson, you can see abundant boulders suggestive outcrop. That's something that we had missed seeing on the premission photos. But - and it isn't as abundant as on the south massif, but there are apparent ledge formers about midslope.

CHALLENGER Yes, let's make it. I don't know if I want - let 51. (Garble) can throw away.

CHALLENGER Okay, Gordie there is also a few very bright sparks - sparkles from the surface - not abundant but a few.

CHALLENGER Let me - I need these.

CAPCOM Challenger, Houston, I'm going to hand you over to the good Dr. Parker here, have a good trip outside there.

APOLLO 17 MISSION COMMENTARY 12/11/72 CST 16:03 GET 115:99 414/2

CHALLENGER Gordie, thank you. You do outstanding
work and we sure do appreciate it, babe.
CAPCOM My pleasure.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/11/72 CST 16:09 GET 115:15 MC415/1

PAO This is Apollo Control at 115 hours 16 minutes. Mission Control at presently is using these coordinates as the landing point. We will continue to try to refine that landing point further. But, as of now, we're saying the landing point is 20 degrees 9 minutes 50 seconds north, 30 degrees 46 minutes 19 seconds east. This would correspond to -- on the map, for those of you who have grid maps, DM 8 and 82.7. This --

SC Other than that, we just made a couple of suit adjustments.

CAPCOM Okay, copy that.

PAO It's estimated that the lunar module, Challenger, is on the planned north south line and approximately 1 to 200 meters east of the planned landing point.

PAO This is Apollo Control at 115 hours 18 minutes. We want to distinguish between the targeted landing point and the planned landing point. It had been the crew's intention all along to land approximately 200 meters east or short of the targeted landing point, the point at which the computer was targeting the Challenger. So, we believe that Challenger is approximately 300 meters east of the targeted landing point, which would put it about 100 to 200 meters east of the planned landing point.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/11/72 CST 16:14 GET 115:20 416/1

CAPCOM Apollo 17, Houston.

CHALLENGER Go ahead, Bob.

CAPCOM Okay, Challenger we've just lost about 16 DB on your high gain signal strength there. We're wondering if you happen to hit the switch there in the move or could you give us a check on it.

CHALLENGER We're no where near it. Stand by 1.

CAPCOM Okay, and Challenger there should be a pitch of 21 and a yaw of minus 45.

CHALLENGER Plus 21 and minus 45, rog.

CHALLENGER Bob, about 2 minutes here.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/11/72 CST 16:19 GET 115:25 417/1

CHALLENGER Bob, this is Jack. On that high gain I'm up to close to 3 9 now. Which is better then when we landed. You want me to do anything to it?

CAPCOM Standby on that.

CAPCOM Leave it alone. It seems to have gone away Jack. There may have been a ground problem.

CAPCOM Did you guys adjust it, Jack?

CHALLENGER Yeah, Bob, we had to fix green bags and a couple other things.

CAPCOM Naw. Did you guys adjust the high gain antenna?

CHALLENGER No. I didn't touch it.

CAPCOM Okay. Copy that.

CHALLENGER Are these PLSSes in there?

CHALLENGER No. That's over there. Oh, did they.
(laughs) I thought it was over on your side.

CHALLENGER Okay.

CHALLENGER See that's over there. Here, these two.

CAPCOM Challenger, we have your hot mike.

CHALLENGER Well, because I ---

END OF TAPE

CAPCOM Challenger, Houston. Over.
SC Go ahead, Bob.
CAPCOM Okay. When you guys get to the top of
page 2-5, and I assume you're down still on the ETB from what
your comments were on the hot mike there. When you get to the
top of page 2-5, we'd like you to put both demand regs to
egress. Over.
SC Okay, Bob. Will do. We'll give you a call
as we go along.
CAPCOM Roger, thank you.
PAC This is Apollo Control at 115 hours 30 min-
utes. Ron Evans in America has about 14 and a half minutes left
before loss of signal on the 14th revolution. He's --
SC While I'm thinking of it, we're working with
one pair of scissors down here. We're going to take them out with
us in ETB. You might make a point of reminding us to bring them
back.
CAPCOM Okay. I copy that. Never did find Ron's, huh?
SC No sir, and I couldn't just leave him up there
and starving to death.
CAPCOM Roger on that.
SC By the way, how's he doing?
CAPCOM Stand by.
CAPCOM Challenger, Houston. Your buddy is doing
great and the sounder is also doing great, which is a surprise, I
guess.
SC I'm glad to hear that. That was no surprise,
Bob. We wouldn't have taken it if it wasn't going to work.
CAPCOM I thought about that after I said it.
SC Bob, I just turned the urinr line heater on.
CAPCOM Copy that.
SC And, the physical status of the crew is
excellent, by the way.
CAPCOM Beautiful. Surgeon's happy.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/11/72 CST 16:28 GET 115:35 419/1

CHALLENGER Hey, Bob we're at the top of 2-5 and I forgot what it was you wanted me to do up there.

CAPCOM Okay, we'd like you to have command REGS, both of them, go to egress please.

CHALLENGER Yes sir. Okay, their egress now.

CAPCOM Okay, thank you.

PAO Ron Evans has just reported seeing a light flash just to the east of crater Orientale.

CHALLENGER Okay, Bob we're in the middle of the first paragraph on - at 11515 in the timeline.

CAPCOM Okay, copy that.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/11/72 CST 16:32 GET 115:39 420/1

PAO This is Apollo Control at 115 hours
41 minutes. Neil Hutchinson who has been the Flight Director
for the CSM America during this past shift will be in the
MSC News Center in approximately 15 minutes for a news
conference for those men who would like to discuss the CSM
with him.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/11/72 CST 16:36 GET 115:43 MC421/1

PAO This is Apollo Control. This upcoming news conference will not be carried on the Public Affairs release line. We will continue carrying the air-ground from Challenger on the lunar surface. The CSM press conference will not be carried on this PAO release line.

SC CDR OPS 5800.

CAPCOM Okay, we copy 5800.

SC LMP's OPS is 6000 plus.

CAPCOM Copy that, Jack.

SC Okay egg.

PAO This is Apollo Control at 115 hours 45 minutes. We've just had a loss of signal with America, which has now gone behind the Moon. We'll next acquire the command module at 116 hours 30 minutes. All going well with Evans in America.

SC Reading slightly under 4.0.

CAPCOM Copy that, Challenger.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/11/72 CST 16:40 GET 115:47 422/1

CHALLENGER Okay, Bob the urine line heater is off
and the urine line breaker is open, and we are down to applying
antifog.

CAPCOM Okay, copy that Challenger.

PAO This is Apollo control at 115 hours
51 minutes. The crew of Challenger, Gene Cernan and Jack
Schmitt are running approximately 20 to 25 minutes behind
the timeline at present - 20 to 25 minutes behind the time-
line. We'll continue to keep you updated as we go along.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/11/72 CST 16:45 GET 115:53 423/1

PAO This is Apollo Control at 115 hours
56 minutes. We have an update on the location of Challenger.
Coordinates 20 degrees 9 minutes 41 seconds north 30 degrees
45 minutes 25.9 seconds east.

CHALLENGER The BRA stowed?

CAPCOM Okay, copy that, Challenger.

PAO Map grid coordinates DM 682.1. This
location is about 80 meters south, 220 meters east of the
targeted landing point.

PAO This location would make it very close
to the planned landing point which was approximately 200 meters
east of the targeted landing point.

CHALLENGER Okay, we're at start PLSS donning on
LMP.

CAPCOM Roger. I copy that.

PAO Donning of ---

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/11/72 CST 16:54 GET 116:01 MC424/1

PAO Donning of the Life Support System, the back-pack, was scheduled for 115 hours 40 minutes, so we're about 20 minutes behind at this time.

SC Okay, the LMP has got the RCU connected to the PLSS.

CAPCOM Roger that, Jack.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/11/72 CST 17:05 GET 116:11 425/1

CHALLENGER Okay, Bob I'm going to get on the PLSS
now.

CAPCOM Okay, Geno copy that.

CHALLENGER The sublimator is on.

END OF TAPE

SC Okay, Bob. I've got my PLSS on. We're picking it up with -- verifying the part on configuration on the upper right hand corner.

CAPCOM Roger. Copy that.

SC Circuit breakers are configured.

CAPCOM Houston, copy.

SC Okay, I'm in VOX. VOX sensitivity is max, A is BR and V is receive. Okay, you can open your breaker and connect to the PLSS comm. Houston, I guess you heard that.

CAPCOM That's affirm. Loud and clear.

SC (garble) just audio breaker. Your audio breaker, that's all.

SC Want some help with that?

SC Yep. Do it while you're facing that way. Just hang them up. Best time to do it. All you've got is water.

SC Okay, Bob. We're getting Jack up on PLSS comm, and we'll be picking it up the comm check here on left hand column of the bottom sheet.

CAPCOM Roger. We're following you.

SC Okay. You're on and locked. Okay, and you got the cover? Okay, your audio breaker closed. Okay, on your PLSS PTT go main, that's right.

SC A? PLSS mode A?

SC A. Okay, tone off, that's flas P.

SC Got a weak tone and good flas P. Got a good tone right now.

SC Okay, good flag 0, and open momentarily.

SC No, it's still there.

SC Okay. PLSS 02 -- what's your PLSS 02 pressure guage?

SC The 02 --

SC Give Houston a call and give it to them.

SC I'm reading 100 percent, Houston.

CAPCOM Roger, Jack, and we're reading you slightly garbled but loud.

SC Okay, you're loud and clear, Bob.

CAPCOM Okay, Jack. You got that, and I'm reading you. How do you read me?

SC Loud and clear.

CAPCOM Okay. We will not unstow the antenna. You are a scosh garbled, but very readable.

SC Okay, stay where you are. Gonna get mine. Okay, audio breaker is --

SC Houston. (garble).

SC Okay, I got a tone.

SC Garble.

SC I got a good flag P.

SC Pressure flag, and I still got an 02 flag.

APOLLO 17 MISSION COMMENTARY 12/11/72 CST17:14 GET 116:20 MC426/2

SC (garble) tone.
SC Okay, the tone is gone. The 02 flag cleared.
SC Okay. PLSS. (garble) A, and I'm reading
10 percent.
SC Okay, note crewman in mode B cannot hear
Houston. Houston, broadcast in the blind 100 percent on the CDR.
CAPCOM Roger, CDR. Houston reads you loud and clear.

END OF TAPE

CAPCOM I'm read you loud and clear, Gene.
CHALLENGER Give me a call ahead.
CHALLENGER 1 2 3 4 5.
CHALLENGER Give me again.
CHALLENGER 1 2 3 4 5.
CHALLENGER I think so, I can't -
CHALLENGER Okay, I'm reading you.
CHALLENGER Okay, PLSS LMP go B.
CHALLENGER Going B. Try that B. A.
CHALLENGER Okay. How do you read me Jack.
CHALLENGER You're loud and clear and I got a tone.
CHALLENGER Okay, give me a short count once.
CHALLENGER Counting 1 2 3 4 5.
CHALLENGER You're great.
CHALLENGER Okay. I had a tone too, I still got
a pressure and a (garble) flag.
CHALLENGER And Houston, how do you read the LMP?
CAPCOM Roger, LMP, we read you loud and clear.
CHALLENGER Okay, Bob, I'm reading you loud and clear
and he's not reading you in this mode, how me?
CAPCOM I read you loud and clear also, Gene.
CHALLENGER Very, very, good. We're both going AR
now. Let's go. Okay.
CHALLENGER Ought to get a tone.
CHALLENGER I didn't, but my vent flag did clear.
Here it is. Tone and a vent flag.
CHALLENGER Hear my tone.
CAPCOM Okay, Jack, the wheel is Houston and the
blade is me.
CHALLENGER Hello, there, Houston. How are you read-
ing CDR.
CAPCOM Reading CDR loud and clear and for your
information your TM on the PLSSs looks good.
CHALLENGER Okay.
CHALLENGER How do you read, Houston?
CHALLENGER Should be LMP.
CAPCOM Houston reads LMP loud and clear now.
You're much clearer than you were before, Jack.
CHALLENGER Very good.
CHALLENGER Okay. Jack, we gave them our quantities
already so squelch.
VHFB LMP, full decrease. Squelch V is full decrease, huh?
CHALLENGER That's affirmed.
CHALLENGER Okay, it's full decrease.
CHALLENGER Okay, on 60 leave the pump breaker closed.
CHALLENGER Oh, that's cold, but that's good. Okay.
CHALLENGER On 16 ECS cabin repress closed.

CHALLENGER Okay, it's - better verify it yourself.
CHALLENGER Okay, it's closed.
CHALLENGER Suit fan Delta P open.
CHALLENGER Okay, Delta P is open.
CHALLENGER And suit fan No. 2 is open.
CHALLENGER Two's open.
CHALLENGER Okay, and I've got suit fan No. 2,
there's a master alarm.
CHALLENGER Okay, and I heard it run down.
CHALLENGER Okay, I don't see a - no there's not a
ECS caution until that thing runs down. In about a
minute or so. We'll watch for that.
CHALLENGER Okay, suit gas diverter full egress.
CHALLENGER Okay, diverter is full egress.
CHALLENGER Cabin gas return, egress.
CHALLENGER Return is egress.
CHALLENGER Suit-circuit release, auto.
CHALLENGER Release is AUTO.
CHALLENGER Okay, OPS connect. Are you ready?
CHALLENGER Yep.
CHALLENGER Okay. Suit ISO activate over ride.
CHALLENGER Okay. Over ride.
CHALLENGER Okay. Disconnect your LM 02 hoses.
CHALLENGER Okay, LM 02 hoses are disconnected.
CHALLENGER Okay, and they're stowed, right?
CHALLENGER Right.
CHALLENGER Okay. Connect OPS 02 hose to PGA blue
to blue.
CHALLENGER Okay, here it is?
CHALLENGER Okay, it's sticking, right - turn
around.
CHALLENGER No, that's not right.
CHALLENGER (garble) of water.
CHALLENGER Turn towards me a little bit.
CHALLENGER Turn to the left.
CHALLENGER There you are cause I got it too.
CHALLENGER Okay.
CHALLENGER Here it comes - right here.
CHALLENGER OPS hose under it now.
CHALLENGER Right here.
CHALLENGER Here it is. Let me get it.
CHALLENGER Right here.
CHALLENGER I'll see it under your electrical cable.
CHALLENGER Guess your gonna want a purge valve in a
minute.
CHALLENGER Okay, that is locked and a lock lock.
Move your arm.
CHALLENGER This is just - and you did it.

CHALLENGER I will in a second.
CHALLENGER Move your arm. I can't see.
CHALLENGER Okay. Right here. Okay, and I'm connecting OPS hose blue to blue retreat purge valve. Let me give you purge valve, and I'll pick that up, Jack.
CHALLENGER Ahh, cup that's just as small as the mock up.
CHALLENGER Okay, here you are. Verify it's in low volt.
CHALLENGER Okay, it's in LOW.
CHALLENGER Slip to the right just a scosh.
CHALLENGER Slipped it to the right just a scosh. Man, that's easy. (laughs) Whee. (laughing)
CHALLENGER Okay. It's installed. And I might be an iceburg when I get out there. But it's going to feel good.
CHALLENGER Okay, it's in. Okay, my purge valve. Low, locked and pinned in.
CHALLENGER Want some help with that. I want to take a look at it.
CHALLENGER There's the old master alarm.
CHALLENGER Okay.
CHALLENGER That should be the water set.
CHALLENGER Yep.
CHALLENGER It's up.
CHALLENGER It's barely ON.
CHALLENGER Ah, you're going to have to push my lock lock down.
CHALLENGER I'll get it.
CHALLENGER I don't know why
CHALLENGER Why don't you check mine too.
CHALLENGER Let's see it. I'm going to have to check you anyway. You mind turning this way.
CHALLENGER Okay.

END OF TAPE

CHALLENGER That's right because it wasn't locked.
CHALLENGER Is that where you want it face it down
or in? You don't want it there do you.
CHALLENGER No, I don't want it there - must have
had it in the wrong - -
CHALLENGER Is that where you want it?
CHALLENGER Yes.
CHALLENGER Okay, it's there.
CHALLENGER Good.
CHALLENGER The lock lock is down and it's verified
low and the pin still is in.
CHALLENGER Okay, look at mine while your there.
CHALLENGER Okay, it's safe and in. Blocks in and
mines low. Pins in, good.
CHALLENGER Okay, let me get my - this thing right
here.
CHALLENGER Reach that hose for me under my arm.
Put it under the electrical cable.
CHALLENGER Okay.
CHALLENGER I think that will be better isn't it?
CHALLENGER Okay.
CHALLENGER Fair and lock stood by lock lock and
the cover is going on.
CHALLENGER Okay.
CHALLENGER (Garble) under that kit here. Good.
CHALLENGER Okay, your covered.
CHALLENGER Okay, I think we're getting to our
favorite part here. Okay third bells are installed on both.
PJ diverted I'll put it vertical.
CHALLENGER Okay, it's vertical.
CHALLENGER Okay, commander repeat that's done.
Drink - let's take a drink then close the descent water.
CHALLENGER My handle is already prepared. And
drink and position mike.
CHALLENGER Oh, that little jar covers are in action.
Okay.
CHALLENGER Had enough water today they could - you
could say you discovered me I'm water on the Moon.
CHALLENGER Okay, let's turn the descent water off,
and let's stow this.
CHALLENGER Okay, water is going off. Descent
water is off.
CHALLENGER Okay. Okay
CHALLENGER Position your mike.
CHALLENGER Okay, mikes are good top of the page.
CHALLENGER Okay, before we turn the fans on let's
make sure we've got - all I got hooked here is the water.

CHALLENGER Those cables are all stowed. Their not
in your way are they?
CHALLENGER No, not in my way. Pretty good.
CHALLENGER Do you want to put this over on them.
CHALLENGER Yes.
CHALLENGER That's probably a little bit better.
CAPCOM 17, Houston over.
CHALLENGER (Garble). Go ahead Houston.
CAPCOM Rog, we're still seeing the commander's
suit disconnect valve in connect.
CHALLENGER How's that?
CAPCOM Yes, there it goes. We got it, thank you.
CHALLENGER Okay, Bob. Okay, we got the get the PLSS
fan on.
CHALLENGER Don't forget that battery power.
CHALLENGER We can donn our helmets, tuck our drink
bags, donn our LEVA protective ARs, secure our tool harness.
CHALLENGER Our O2 umbilicals are already stowed.
(Garble) are the hand holds. Verify the following.
CHALLENGER Now we're where we pick up our -
CHALLENGER Have to put the helmets on, I think.
CHALLENGER Okay, yes then we pick up our gloves.
CHALLENGER I reckon. Yes, there it is okay.
CHALLENGER Belt. Let's do one at a time here (garble)
yours.
CHALLENGER Okay, you want to turn your fan on for
circulation.
CHALLENGER Well, I guess I better fans on.
CHALLENGER Now pull this out just to get it out of
your way.
CHALLENGER Okay.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/11/72 CST 17:34 GET 116:40 MC429/1

SCHMITT Okay. Okay, all your candy bars, and lemon-
ade, and all that jazz are all clear. Bar, I should say.
CERNAN Um, that sounded good.
SCHMITT Okay, try it.
CERNAN Okay, it looks good here, Jack.
SCHMITT Okay, and what's your LEVA?
CERNAN (garble) Okay.
SCHMITT Enjoy it in there; you're going to be in there
for a few hours.
CERNAN Can't think of any place I'd rather be right
now.
SCHMITT It sounds like you're in there, too.
CERNAN Darn, too far back. Okay, that's better.
SCHMITT These are mine you don't want off.
CERNAN Me, too. (Laughter)
CERNAN Okay, does that look lined up to you?
SCHMITT Looks pretty good.
CERNAN Okay, let me -- wait a minute. I must get
this down around --
SCHMITT Okay, that's around behind you. Thermally
protected back there. That's below the OPS hose.
CERNAN Right now, I'm hoping to get out of this
water. (Laughter)
SCHMITT Okay, you're thermally -- let me doublecheck
that. The helmet is locked. Your visor is locked.
CERNAN It's one thing you don't want to lose among
some others.
SCHMITT Okay. Okay. You want to give me a hand?
CERNAN Not particularly. (Laughter)
SCHMITT Oh, man, where did that come from?
CERNAN Watch your nose, drink bag, candy bars, pop-
corn.
CERNAN Click, click, click.
SCHMITT Breathe hard back there.
CERNAN Want your fan?
SCHMITT Yep.
CERNAN Looks good.
SCHMITT Okay, I can hear the fan running.
CERNAN Oh, man, whew.
SCHMITT Looks good here.
CERNAN That's swell.
SCHMITT Steady (garble)
CERNAN New. Never been used before.
SCHMITT Make sure that flap is back. Goes below that
FPS hose.
CERNAN Yep. Want to put your protective visor down?
SCHMITT Yeah, if you'll get this thing off.

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CERNAN Got it all done?
SCHMITT Yeah.
CERNAN You happy with it back there?
SCHMITT Yessir. You're nice and protected.
CERNAN Okay.
SCHMITT Good Velcro. Okay, you're all covered here.
CERNAN Okay. Not my other one is it? No.
SCHMITT No.
CERNAN Okay. Ohhh.
SCHMITT I think we've got to get two harnesses here.
Donned LEVA's. Look at the scratch right in the middle of that
thing. Okay, donned LEVA's and lowered protective visors.
CERNAN Okay. To clear harness, install silk straps.
SCHMITT Okay. Stay where you are.

END OF TAPE

CHALLENGER Can't miss it.
CHALLENGER Okay, still LM O2. Still O2. And comm.
Okay, their all stowed everything except water, right.
CHALLENGER Okay, verify the following. Check your
helmet computer.
CHALLENGER Okay, you check me I'll read them. Hel-
met visor alined and locked.
CHALLENGER Okay, that's locked.
CHALLENGER Okay, O2 cover is all locked. There's
a peek at them.
CHALLENGER That's locked. Purge valve everything
down there.
CHALLENGER That's locked, that's locked.
CHALLENGER Comm carrier.
CHALLENGER Stand by. That's locked. Okay diverter
valve is vertical. Comm is (garble) diverter valve vertical.
CHALLENGER Okay.
CHALLENGER One more time. Your helmet is locked,
purge valve is locked. That's locked, that's locked, that's
locked and let me see - let me see sure and it's locked.
CHALLENGER Don't let anything detain us.
CHALLENGER And the diverter valve is vertical.
CHALLENGER Okay, comm you check too.
CHALLENGER Yes sir.
CHALLENGER Okay, verify your old white dots.
CHALLENGER Okay, old white dots.
CHALLENGER My old white dots. Can you manage to
move a little?
CHALLENGER Yes, I'll move.
CHALLENGER Okay, I've got it.
CHALLENGER I'm going to miss Danny being out there
to hand us those light PLSS's.
CHALLENGER That's right. Okay, I want the EVA de-
cals also, Jack.
CHALLENGER Yes, white dots plus decals.
CHALLENGER Rog. Okay, Bob we're turning the page.
CAPCOM Roger, we're right with you.
CHALLENGER Okay, don EV gloves.
CHALLENGER Okay.
CHALLENGER Is that it?
CHALLENGER That's it.
CHALLENGER Don EV gloves. Do a little crease in
here.
CHALLENGER And make sure your wrist locks are locked.
CHALLENGER Glove strap adjusted and cover the wrist
rings.
CHALLENGER Golly - -

APOLLO 17 MISSION COMMENTARY 12/11/72 CST 17:39 GET 116:45 430/2

CHALLENGER I sure miss hearing it click, but they
are locked, one of them is anyway.
CHALLENGER Hey, Jack (Garble).
CHALLENGER (laughter).
CHALLENGER Guess what?
CHALLENGER They don't go out any easier in one sixth
g do they.
CHALLENGER They break just as easily too. Okay,
I've got my one glove locked. One of them - one of the old
foot covers.
CHALLENGER I never had that happen in training, you
did.
CHALLENGER It's locked - that's about as locked as
it can go. Boy how would you like to hear that pop open.
CHALLENGER Okay, that's very good. You want me to
help you with one or can you get it?
CHALLENGER Well, I don't know. I've only worked on
1 so far.
CHALLENGER I've got a free hand before I grease it
up.
CHALLENGER I broke that one.

END OF TAPE

CERNAN I'm telling you, from the looks of that soil out there, that drill may have a job ahead of it.

SCHMITT Yeah, I didn't have a chance to mention that. I don't think the regolith is very thick, and I think you've got rocks below it.

CERNAN You got that?

SCHMITT Well, how does it look?

CERNAN Let me take a look.

SCHMITT Nope.

CERNAN Didn't make it, huh?

SCHMITT Yeah, let me -- hold your hand up here -- hold it up here.

CERNAN Looks good on my side. How is your side?

SCHMITT Good over here.

CERNAN Okay, let me pull this down for you.

SCHMITT Okay, thank you. Get the old other hand.

CERNAN Okay, that's locked.

SCHMITT And my other glove is locked.

CERNAN -- now for the -- putting it back.

SCHMITT Oh, me oh my.

CERNAN I think I got it. I think I got it.

SCHMITT Pull it and let go. Isn't that the word?

CERNAN That's what they tell me. Want me to do it?

SCHMITT No, I got it.

CERNAN Verified yours is locked?

SCHMITT Yessir.

CERNAN Both my gloves are verified locked.

SCHMITT How does that grab you?

CERNAN Okay, feels good.

SCHMITT Is your air on tight enough? Checklist on tight enough?

CERNAN Best I can do, I guess.

SCHMITT Okay. Now what?

CERNAN Restraighten the cover. Don't (garble).

Now mines all right. Yours okay?

SCHMITT No, it's fine.

CERNAN Okay. All DC colds required. We been on cold all the time, right?

SCHMITT Yeah.

CERNAN Okay. Guess you can open that breaker, and I'll stop shivering. (Laughter)

SCHMITT Okay.

CERNAN And, we can disconnect the LM water hoses. Let's help each other with air, so we don't screw up the other hoses.

SCHMITT Okay, breaker's open.

CERNAN Okay.

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SCHMITT Let me turn around this way.
CERNAN Okay. Go in and out. Okay. You want to
get mine or --
SCHMITT I'll get yours.
CERNAN Okay?
SCHMITT Okay. First of all I'm going to take
that off.
CERNAN Okay, now let me get your other one. There
it is.
SCHMITT Okay. We did this before. Stand right there.
CERNAN It's locked, Jack.
SCHMITT Okay, it is locked?
CERNAN Get the cover on. Okay, the cover is on.
Turn yours off. Get that in a second.
SCHMITT Okay, yours is just laying there, too.
CERNAN Okay, hang on.
SCHMITT Okay, I'll push towards you.
CERNAN Make sure that thing falls in the hole, be-
cause yours didn't right away.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/11/72 CST 17:47 GET 116:54 432/1

CHALLENGER Did it fall in?
CHALLENGER Yes - yes it's in the hole. Okay left
cover on.
CHALLENGER Left covers on.
CHALLENGER And my PGA is going to start biting here
if we don't get going.
CHALLENGER Okay - okay - PLSS to the --
CHALLENGER I've got to turn my oxygen on a second
Jack.
CHALLENGER Yes, so do I.
CHALLENGER That's that, there it is. Okay, it's on.
A little hard to get it off isn't it.
CHALLENGER Okay, mine is back off.
CHALLENGER Yes, mine is.
CHALLENGER Okay, PLSS diverter valve in - verify.
CHALLENGER Okay, mine is in.
CHALLENGER Okay, PLSS pump on, it's to the right and
pressurize A and B egress.
CHALLENGER I think we're already at egress.
CHALLENGER Pump's on, we're at egress. Okay, my
Pump is on I can feel it running.
CHALLENGER Keep talking.
CHALLENGER Pressure integrity check. Okay PLSS 02
on - you ready for this.
CHALLENGER I hope so.
CHALLENGER PLSS 02 on - mines on. Press flag and
02 flag clear 31 to 34.
CHALLENGER Okay, I'm coming up. I know that. Gee,
it's 10 minutes to 6 at home. Okay, I'm still coming up,
coming up.
CHALLENGER Just got mine on.
CHALLENGER Oh, okay, well I'm ahead of you then.
CHALLENGER Yes. Okay, the press flag will clear
37 correction 31 to 34. What do you want me to do when I'm
pressurized?
CHALLENGER We'll want to make an integrity check.
CHALLENGER Yes, but then what?
CHALLENGER Can you reach those water hoses right
there by chance before you get too hard?
CHALLENGER Throw them out of the way.
CHALLENGER Okay, when you get - when you get up -
CHALLENGER Okay, a press flag cleared on the com-
mander. Okay, the 02 flag did not clear I'm at 3 - okay 02
flag cleared on the commander.
CHALLENGER Still got an 02 on the LMP.
CHALLENGER Okay, your not up yet I suppose.

CHALLENGER No.
CHALLENGER Okay, I'm going to take my PLSS 02 off
for one minute - 57
CHALLENGER Let me know when your up, Jack, and I'll
give you a minute hand.
CHALLENGER Okay, I'm clear.
CHALLENGER Okay, you up?
CHALLENGER Yes.
CHALLENGER You can turn your PLSS 02 off anytime,
let me know when. Can you reach it. I'll get it for you.
CHALLENGER Why don't you get it.
CHALLENGER Okay. Okay, mark it.
CHALLENGER Okay.
CHALLENGER Your on the 0 second mark and I'm on the
minute mark.
CHALLENGER Okay and I'm 3.8.
CHALLENGER Okay I'll give you a hack on it.
PAO Still about 20 minutes behind time.
CHALLENGER About 45 seconds.
CHALLENGER Okay, I'm one minute going back on.
CHALLENGER Okay, Houston commander went from 3.8 to
about 3.67.
CHALLENGER I'll get yours on when you need it on,
Jack.
CAPCOM I copy that commander.
CHALLENGER Okay, and we'll pick Jack up here in about
10 more seconds.
CAPCOM Copy.
CHALLENGER Okay, Jack I'm turning on did you mark
it?
CHALLENGER Okay, Houston 3.8 to 3.6. Houston did you
copy the LMP?
CAPCOM Roger, copy the LMP. Okay and Challenger -
CHALLENGER Okay stand by for you're go to depress
CAPCOM - you'll be glad to know you are go for
depress.

END OF TAPE

CHALLENGER Thank you, Robert, I understand we are
GO for depress.
CAPCOM That's affirmed.
CHALLENGER Okay, Jack, can you reach the front valve
or do you want me to.
CHALLENGER Well, let me turn around here.
CHALLENGER Okay, on 16, first around 16 cabin re-
press OPEN.
CHALLENGER Okay, 16, cabin repress OPEN. Circuit
breaker is coming open.
CHALLENGER Okay, and cabin repress valve closed on
the panel.
CHALLENGER Okay, the valve is closed.
CHALLENGER Okay. If you can't reach it, I guess
I can.
CHALLENGER Okay, I just had a momentary tone.
CHALLENGER So did I. I got it too.
CHALLENGER Okay.
CHALLENGER I got it when you closed the repress
valve.
CHALLENGER Can you reach it? If not I'll reach the
overhead one.
CHALLENGER I think you better reach the overhead
one.
CHALLENGER Okay.
CHALLENGER Slip over to your right.
CHALLENGER Some more.
CHALLENGER Let me turn here.
CHALLENGER Wait a minute, I get turned
CHALLENGER Okay, how far down are we going to take it?
CHALLENGER 35, right?
CHALLENGER Yeah, wait a minute.
CHALLENGER I'm not there yet.
CHALLENGER Well, I just want to make sure that I'm
watching.
CHALLENGER Okay, now.
CHALLENGER Okay, coming open. You ready? You reading
the checklist?
CHALLENGER Standby AUTO. (garbled) press is closed. Say
when, okay, Jack.
CHALLENGER Are you ready?
CHALLENGER Wait a minute, wait a minute. Got the
wrong place.
CHALLENGER Open, then AUTO at 35. Okay, go ahead.
CHALLENGER Okay. Here it comes.
CHALLENGER I can see daylight through it. Okay, it's
coming down. Okay, that's
CAPCOM Cabin pressure is coming down now.
CHALLENGER Standby.

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CHALLENGER Mark. 3 5.
CHALLENGER Okay. It's OFF.
CHALLENGER Okay.
CHALLENGER And your cuff gage should not be below
46 and mine's at 5 - mines at 50.
CHALLENGER Okay.
CHALLENGER Okay. The suit check is locked up at
45. We're at 35 and holding.
CHALLENGER And I'm decaying.
CHALLENGER Okay, I'm below 5.
CHALLENGER So am I.
CHALLENGER Verify that, okay.
CHALLENGER Okay. I'll start my watch.
CAPCOM Okay, we verify and we're counting.
CHALLENGER Watches started.
CHALLENGER Okay, overhead A4 dump valve open. Okay,
here it come. And it's going down.
PAO Unofficial start of EVA 117:01:35.
CHALLENGER (garbled) or not.
CHALLENGER Turn around, Jack.
CHALLENGER Ah, standby.
CHALLENGER (garbled) Leave it open.
CHALLENGER No we don't cause then we don't want that
hatch to get full.
CHALLENGER Here, turn around.
CHALLENGER Oh, boy.
PAO Cabin press below 1 lb per square inch
now.
CHALLENGER Boy, you sure gets heavy at 5, don't you.
CHALLENGER Okay, where are we?
CHALLENGER Right here, huh?
CHALLENGER But that was -
CHALLENGER Check the cabin, Jack.
CHALLENGER Do you read, Jack?
CAPCOM Jack, this is Houston. CDR we're not
reading the LMP either.
CHALLENGER Just a minute. Now how do you read?
CAPCOM We read you.
CHALLENGER Okay, you're loud and clear, Jack.
CHALLENGER Okay.
CHALLENGER We got a switch in the wrong place
as usual, Bob. Just hit the 0 select that's all.
CAPCOM Okay, we copy.
CHALLENGER Okay. Starting to open the forward
hatch when we can.
CHALLENGER Okay, can you step over to the left as
much as you can.
CHALLENGER To the right, you mean.
CHALLENGER Yeah, to the north. The north.
CHALLENGER Okay, it's about .2, Gene.

END OF TAPE

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SCHMITT Okay, let me ...
CERNAN You going to be able to get to it?
SCHMITT Yep, you bet you. I've come this far. I'm not
going to miss getting a hatch open. Hey, something just flew out.
It's open now.
CERNAN Gosh, look at those trajectories.
SCHMITT Put just enough air in here, we're ... okay,
it's open, babe. Okay, it is open.
CERNAN Good.
SCHMITT Okay final prep, PLSS primary H2O. I've got
to figure out how to open that now.
CERNAN Okay.
CERNAN When you're at 5 PSI , it's, we never did really
train for this in the right way.
SCHMITT Yes we did. Okay, my water is open.
CERNAN And my water is open.
CERNAN Okay. Well, let's see switch to cooling
position 37 a 4.6. I'm 4.9 coming down.
SCHMITT Yes, I am too. Coming down.
CERNAN CWEA status.
CERNAN How are the amps on EPS. Can you see that?
SCHMITT See 3 amps and I see EPS.
CERNAN Okay. Water SEP component light on.
SCHMITT Water, excuse me, water SEP. Hell, the next
thing it says that Gene gets out.
CERNAN I don't see that.
SCHMITT That's what it says on my checklist.
CERNAN Okay. Good heavens. That means you got to
get out of the way so I can open the hatch.
SCHMITT Well, I'm going to have to turn around a little
and see if I can help you.
CERNAN Okay. Boy, beware of that corner. It's
high pressure.
SCHMITT Yes. I tell you at 4 and a half you're really
pretty heavy.
CERNAN What was that that came shooting up here?
A piece of bread? Would you believe that?
SCHMITT Yes, I'd believe it.
CERNAN Hey, our hatch opened, somebody opened our
hatch.
CERNAN Are you getting cooling?
SCHMITT I'm beginning to I think. I still got a water
flag. Not hot. Okay. Hell.
CERNAN Standby.
SCHMITT How does the water pressures look, Houston.
CAPCOM Challenger, they're looking just a little bit
low. We're still stuck with the buildup. It's going to take a
little while.
CERNAN Okay, I'm getting down on my knees out here. How

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CERNAN am I looking, Jack?
SCHMITT You're just fine. I'm holding you away from
the DEDA, the DSKY.
CERNAN Okay, I'm going to put the visor down now,
I think. How does that look to you?
SCHMITT What?
CERNAN How are my legs? Am I getting out?
SCHMITT Well, I don't know. I can't see your legs.
CERNAN Oh, okay.
SCHMITT I think you're getting out though, because there's
not as much of you in here as there used to be. Oh, hey, Gene,
when I get down there, I got to fix your tool harness. Hold it.
CERNAN Okay, can you reach it?
SCHMITT It's come off the bottom again.
CERNAN Can you reach it?
SCHMITT Well, I can't do it now, because it's come
off from the bottom. I'll have to ...
CERNAN Oh, the bottom of the PLSS. huh?
SCHMITT Yes.
CERNAN Okay. My legs are out. Keep that hatch
open.
SCHMITT Can you squat down any further, because you're
hooked on ..., you're making it worse.
CERNAN Okay, how's that?
SCHMITT Okay, now I think I..., be careful because
you might hook it on something down there.
CERNAN Oh, the tool harness?
SCHMITT Yes. The back, It's loose on your back, on
the back of the PLSS.
CERNAN Oh, man, I don't like that. Okay, I'll watch
it.
SCHMITT Well, I'll fix it when I get out there.
CERNAN Okay, I'm still reading 40. Houston, Comman-
der is on the porch of Challenger.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/11/72 CST 18:02 GET 117:09 MC435/1

CERNAN -- Challenger.
CAPCOM Roger, we copy you, commander, and your feed water pressure is looking much better now, and you're probably getting cooler.
CERNAN (Garble) Okay, everything else look good to you?
CAPCOM That's affirmative.
CERNAN Okay, Jack. I gonna get to MESA.
SCHMITT Okay, and I'll have an ETB ready for you.
CERNAN Oh man, oh man, oh man.
SCHMITT Deploy MESA.
CERNAN Okay. Here it comes. There she goes, Babe.
SCHMITT Yea hey.
CERNAN There she is. All the way down it looks like.
SCHMITT Okay. I jettisoned -- oh, you want an ETB?
CERNAN Hey, that's up to you.
SCHMITT Yep. You're the commander.
CERNAN I got it, I got it. Man, the pressure looks like it started to stabilize at 38. I don't know whether I'm getting cooler or not, but I feel pretty good.
CAPCOM Okay, we copy that, too. Okay?
CERNAN Oh, Jack, I could swing it over the -- won't be any problem. Over the strut. Okay, the jett bag is swringing free, swinging free.
SCHMITT You mean the ETB.
CERNAN ETB. Oh, man, this looks like a Santa Claus sack.
SCHMITT It is. Oh, boy. There it goes. The Rover looks in good shape.
CERNAN ETB is down there. Okay, I've got all my visors down. Jack, I wouldn't lower your gold visor until after you get on the porch because it's plenty dark out here.
SCHMITT Okay.
CERNAN Okay. Tape recorder. I'm on my way.
SCHMITT He's off.
CERNAN Sensitivity max and max.
SCHMITT Okay, Houston. The commander is about three quarters of the way down.
CERNAN I'm on the footpad. And, Houston, as I step off at the surface at Taurus-Littrow, I'd like to dedicate the first step of Apollo 17 to all those who made it possible. Jack, I', out here. Oh, my golly. Unbelievable. Unbelievable, but is it bright in the Sun. Okay. We landed in a very shallow depression. That's why we've got a slight pitch up angle. Very shallow dinner-plate-like dish crater just about the width of a strut. How you doing, Jack?

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SCHMITT Fine. Getting the circuit breakers
verified.

CERNAN The LM looks beautiful. Oh, do we have
boulder tracks coming down. Can't exactly where we are. I
think I may be just in front of Punk.

CAPCOM Okay. We copy that, Gene, and are the boulder
tracks to both the north and south?

CERNAN I'm beginning to --

END OF TAPE

CERNAN Okay, on the North Massif we've got very obvious boulder tracks. A couple of large boulders come within 20 or 30 feet of the - looks like where we can get to 'em, but there's a couple - there's a couple I know we can get to. There the sun angle is such that what I saw on the South Massif earlier I can't see very well, but I know there were boulder tracks over there. The - Bear Mountain - boy, it's hard to look to the east. Bear Mountain and the Sculptured Hills have of a very, very similar texture on the surface. Sculptured Hills is like the wrinkled skin of an old, old, 100 year old man is probably the best way I could put it. Very, very hummocky, but smoothly POC marked. I do not see any boulders up by the Sculptured Hills from here. But it's awful hard to look to the east and southeast.

CAPCOM Okay. We copy that, Gene. Do you have an LMP with you yet?

CERNAN Man, here come his feet. Jack, let me make sure. We didn't have an awful lot of dust on landing; but I can dig my foot in 8 or 10 inches and I know we're at least that thick. There's a small little one meter crater right in front of us with a whole mess of glass right in the middle. That's right in front of the base as a matter of fact. Right where I want to park the Rover. Jack, you're looking good.

CAPCOM Beautiful, guys, beautiful.

CERNAN I'm going to take a quick look back. I think this is Poppy, and I can give you a real better idea where we are. Hatches closed barely. Hey, Jack, don't lock it.

SCHMITT I'm not going to lock it.

CERNAN We gotta go back there. You loose the key and we're in trouble.

CERNAN Oh, I'm on the porch. Who said this place was smooth? Ah, boy. There's a lot of local depressions here I didn't figure existed.

SCHMITT Hey, whose been tracking up my lunar surface?

CERNAN Hey, Bob, I'm east of the LM now. I'm east of the LM and the back strut of the LM is - the left strut of this crater I talked about, and that's where we get the pitch angle, the best strut is probably down in the eastern one-third of that crater. Just a little - very subtle crater.

SCHMITT Hey, man, you had some forward velocity.

CERNAN That's what I wanted to have.

CERNAN Boy, look at some of these rock that are filleted here, Jack, and there sure are sparklies in them. Awfully lot of sparklies.

SCHMITT You landed in a crater.

CERNAN Pretty good shot.

SCHMITT Okay, I'm going to get to work in a minute just as soon as I take a look at Trident.

CERNAN Why don't you come over here and let me deploy your antenna.

SCHMITT Okay.

CERNAN Just walk around for one second.

SCHMITT (laughs)

CERNAN Hey, man, put your visor down.

SCHMITT I'll be over there and you can fix my tool irons. I don't like that thing loose.

CERNAN I don't like it loose either.

SCHMITT What are you doing over there? We're supposed to be working.

CERNAN I was just going to give them a fix. All these little craters, Jack, have glass in the bottom of them. Here's another one.

CERNAN A very clear sweeping of the surface by the descent boom out, oh, about 10 meters - no, 15 meters. Come over here and I'll fix your antenna. Okay?

SCHMITT Hey, Bob, how big is Poppy supposed to be?

CAPCOM Standby. It looks ---

END OF TAPE

CAPCOM It looks on the map -
SCHMITT I didn't hear you you cut out.
CAPCOM Okay, it looks on the map like it's
about 75 meters in diameter. Fairly subtle.
SCHMITT Okay, I tell you what - I think I landed
about a 100 meters from Poppy at 10 o'clock.
CERNAN You think that's Poppy, huh?
SCHMITT I think so - I think -
CERNAN That's an awful big hole.
SCHMITT Well, I know I got to look around a little
more. It sure is not Trident.
CERNAN It might be part of Trident. Get your antenna.
SCHMITT Oh, a little more.
CERNAN God, it's beautiful out here. Well, hang
on.
SCHMITT Okay the immediate surf - -
CERNAN Okay, you talk to them I don't want you
to (garbled) up yet.
SCHMITT The surface is moderately cohesive which
holds a pretty good boot print - very fine grain, Gene looks
very much like previous soils you got it?
CERNAN Yes.
SCHMITT You got to hold mine.
CERNAN I'll stand and you can get at it better.
Well you got me right in the Sun. Can you come around this way.
(laughter) I'm going to have to get upstream of you.
SCHMITT Look you get up on the hill and I'll get
in the hole.
CERNAN There you go wooh wooh wooh, don't move
too fast. Boy your seat looks like you just walked on the
Moon you know.
SCHMITT Well, I tell you Gene, I think the next
generation ought to accept this as a challenge.
SCHMITT Let's see them leave footsteps like these
some day.
CERNAN I'll be alright.
SCHMITT Okay, what did you do with my tool harness?
CERNAN I'm going to work on it that's what I'm
going to do. Oh, hold still.
SCHMITT Okay. Boy, I tell you looking to the
east you might just well forget it.
CERNAN Well, let's see how's this thing - I'm
going to have to loosen it.
SCHMITT Well, if you could just stretch it around.
CERNAN I can't.
SCHMITT You can't huh?
CERNAN But, I will be in a minute.
SCHMITT Don't loosen it to the point where you
can't get it back on.

CERNAN Okay, you're almost reconfigured.

SCHMITT Okay. Okay.

CERNAN Somebody tied you on wrong too. They got the strap reversed for the velcro.

SCHMITT Okay, Gene, I think that will hold if it doesn't I'll fix you again.

CERNAN And there is sparklies in the soil, Jack, you can just look at it. See them all over? Very fine grain it's sparkly that's all. Bob, I'm going to midcooling or intermediate cooling.

CAPCOM Okay, copy that.

SCHMITT Boy that sure - see the soil sparkle.

CERNAN Yes, I think that's a little glass.

SCHMITT Let's go back here and get to work and I'll show you that crater that's got nothing but glass in the bottom. That's a vesicular rock of some kind there, Geneo. It almost looks like (garbled) craters.

CERNAN (Garble) but don't quote me.

SCHMITT Bob, I have to reiterate. Even the small even the very small the one and two inch three inch fragments that are laying around here have been dusted and filleted with the dark mantle. And that sweeping by the descent stage goes all the way out there Houston, where we were, which is about 50 meters I guess. Hey man - these rocks they almost have a pink - very light pinkish hue to them, and they are not there are not obviously breccia now that's a breccia fracture there. But this stuff is something else again. I don't think there is any place you could land down here where you wouldn't have one foot in the crater.

CERNAN Looks like a vesicular very light colored (garble) of some kind about 10 or 15percent vesicals I'm right in front of the LM.

END OF TAPE

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SCHMITT Say, quite a few of the rocks look of that type. Sort of a pinkish hue to them The texture is coarse, but I'm not sure how crystalline they are yet.

CERNAN Okay, back to work. Jack, when you put up the ATV, check down there below it. Okay, let's take a look at the Rover.

SCHMITT Let's don't forget those.

CERNAN Yes.

SCHMITT That's my fault, I guess.

CERNAN Yes.

SCHMITT Okay.

CERNAN Oh man, I tell you, we came down just a little forward velocity.

Look at that. Right there.

About a foot slip on the pad.

SCHMITT I tell, you, there's craters all over here.

CERNAN Okay, baby. I'd sure like to think that that wheel is where it's supposed to be. It looks good to me.

SCHMITT Our next little vehicle to work.

CERNAN Okay. Bob, so far the Rover looks pretty good.

CAPCOM Roger, sounds good Geno.

CERNAN Hey, let me ask you. When I was behind the LM, I could look right into an area and see the bell of the ascent stage. I never realized that before, but I guess that's normal huh?

SCHMITT Yes. We saw it on the pad. Remember.

CERNAN Barely.

SCHMITT Remember when we went out there.

CERNAN The only reason I asked Bob, I'm sure it's normal, and it doesn't look anything's missing, it's just right into the Sun.

CAPCOM Yes. The consensus of opinion down here is that you can also.

CERNAN Yes, that's probably the best place in the world to get a consensus of opinion from. Okay, Jack, it's about work time. I've got this Rover about ready to work.

SCHMITT I got a little delayed here.

CERNAN Okay. I'm glad those guys made us train so hard.

SCHMITT Okay, the MESA's up. Let me know when you're ready to deploy.

CERNAN Okay. Babe, I am, I am ready for you. Everything I can see looks pretty good. The walking hinges, you will be glad to know, are intact. They did not drop.

CAPCOM Roger. That's a first.

SCHMITT You want me to go up there and do that, huh?
CERNAN Yes, sir. The beginning.
SCHMITT You ready for me to deploy?
CERNAN Okay, let me just double check. (garble,
garble, garble, garble, garble).
SCHMITT Base of insulation is not coming off as easy
as in training.
CERNAN Okay. outrigger cable's are taut.
Looking good to me. Yes, Jack. You can go on up. go on up.
SCHMITT Okay.
CERNAN I'm ready for you. God, that LM is a pretty
sight. Challenger you're a beauty.
SCHMITT Well, let's see how good I am.
CERNAN Don't drop that. Let me get that ...
CERNAN Yes, sir. You're pretty agile there twinkle
toes.
SCHMITT You bet your life, I am.
CERNAN All I asked you to do was pull that handle
up there. Man, anything you grab, Jack, I just grabbed this
lanyard that was in the dust, and it's really black.
SCHMITT You ready? Go.
SCHMITT She fell, Houston. She's open. Okay, you've
got parallel chassis, the wheels look good on this side.
CERNAN Okay, they're good on this side. Let's get
done, let's get it out.
CERNAN I'll wait for you to get the deploy cable.
PAO Deploying the Rover now.
CERNAN Hey, Jack, this place is not locally level.
SCHMITT You, you are right.
CERNAN Now, there's not many places you could
put the LM down and have it be zero, zero, zero. Okay, I'm
ready if you are.
SCHMITT I don't know how much help I'm going to
be.
CERNAN Yes, I'm starting, you pull. It's coming.
It's coming. It's coming baby. How's your wheels on that
side? Can you see them? Mine look good.
SCHMITT Wheels, they looked good a minute ago.
I got the Sun so I can't tell much --
CERNAN Okay.

END OF TAPE

SCHMITT Eeee. The only way to do it.
CERNAN I'm putting all my weight (laughter) --
SCHMITT Okay, wait a minute. I'm coming down now.
She's going to pop here.
CERNAN Okay. Wait a minute. Stand by. I may pull
a Jim Irwin here.
SCHMITT Wait a minute. Watch out. Here she goes.
Got her.
CERNAN Okay. Beautiful, Houston. Jack, check these
out.
CAPCOM Roger, beautiful.
CERNAN Beautiful. Whoa, wait, wait, wait. Started
to get off the hinge there.
SCHMITT Yep, yep. She's on, though.
CERNAN She's all right. She's on the walking
hinges. I wish you could see it. Jack, those wheels did not
lock all the way up, though. We ought to pull them up before we
wrap (garble) Well, there it goes. By itself.
CERNAN Okay. Wait a minute, wait a minute. Okay.
Let me pull it until the outriggers cables get slack.
SCHMITT Okay.
CERNAN Walk away from it. Easier.
SCHMITT That tape up there on the reel.
CERNAN Yeah, it's all -- it's coming. It's free
reeling.
SCHMITT Yeah.
CERNAN I mean -- let me -- don't pull it till I -
Okay, now I've got it.
SCHMITT I'd walk and fall into that crater if I went
to the end of this line.
CERNAN Houston, I do think we've got a different --
oh, we're deploying it at an angle. Okay, the outrigger cables
are free, Jack.
SCHMITT Okay. Got a different breed of rock up here.
The stuff's sticking through this thin regolith -- or regolith,
period. I don't know whether it's thin or thick yet.
CERNAN Oop, oop, oop, ba doop, boop. Okay, mine's
free.
SCHMITT Let me get this -- let me get all this cable
out of the way. Otherwise, I'll -- is that enough of this stuff.
I don't like all that over there. (Garble)
CERNAN A geologist's paradise, if I ever saw one.
SCHMITT Boy, you certainly are changing the color of
that cable, sir.
CERNAN Yeah. Just tried a John Young trick.
SCHMITT Did it work?
CERNAN Yeah. (Laughter).
SCHMITT You're getting dirty.

CERNAN But, I'm still getting my balance. I didn't touch the ground.

SCHMITT Just got to get some of this cable out of here.

CERNAN I'm not sure my pockets are going to be acceptable. Man, I'll tell you, I don't know how long this line to pull the Rover out is, but --

SCHMITT Well, I'll tell you, it sure is easy to get dusty, but that's nothing new to anybody.

CERNAN Okay, Babe, let me get -- I think it's safe to say the surface was not formed yesterday. There is a regolith, it looks classic. Varied distribution of particles up to three or four centimeters anyway. Then, you start to get maybe a selective distribution of large fragments. Get that cable?

SCHMITT Yep. Hey, I'm going to walk away with this one.

CERNAN Okay, outrigger cable. You ready?

SCHMITT Okay. With four wheels on surface, okay. Let me -- let me pull.

CERNAN Okay, Houston. She's continuing to come.

SCHMITT Here's a couple of different looking rocks. One's very white, one's quite dark. But, we do have a general rock type, I think, in the area of the big boulders. Jesus, how much cable is there?

CERNAN There's a lot of it, Jack. Keep going. (Laughter) You're going to be a long way away. We're not there yet. Keep going. Okay, we've got the front wheels on the surface, but keep going, I don't think you've got it up there.

SCHMITT I never thought I'd do geology this way.

CERNAN Okay. I think you got it. Let me see. Is it slack?

I'll get up there and take a look.

SCHMITT Okay, it's slack.

CERNAN Longest cable in the world.

SCHMITT It's slack.

CAPCOM Wait till you get to the ALSEP package.

CERNAN Okay, by golly, those wheels did lock.

(Laughter)

SCHMITT I never knew that cable was that long, Bob. Ohhh, a glass bottom crater with a little bench. Looks like one of the Flagstaff explosion craters except for the glass in it. Right out at 12 o'clock. That's the one I was talking about, about having a bright halo. I don't know whether it's easier to walk out there or to do what I did in training that I wouldn't do on the Moon. Somebody's going to get tangled up with this thing.

CERNAN That's why I'd get it all under the LM somewhere. I'd -- what I'd -- took me 5 minutes to do is get it all out of the way. Okay, Bob, the front wheels locked in. I had to pull the rear wheels back to get them to lock in.

CAPCOM Okay. Copy that.

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SCHMITT At least no one let any air out of the tires.
Man, I look like I've been on the surface for a week already..
Holy, smoley. Okay. Pull pins and deploy cable and fittings -
move LR --

END OF TAPE

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CERNAN Okay. Pull pin to deploy cable and fitting
Move LRV from left.

SCHMITT Wait a minute I haven't left ---

CERNAN Okay.

SCHMITT --- other pants.

CERNAN It's going to take a while. Think we
can avoid that cable?

SCHMITT Why don't you set it there, pull this
pin and you go back and get it, that is, it's better to
use the Rover contingency ---

CERNAN But that's off over there on the ground
some where another.

CERNAN Pull that pin. Till we get that saddle
loose.

SCHMITT Ah, beautiful.

CERNAN Yeah, we're going to have to move that
line, Jack, are you ready.

SCHMITT I'll move it.

CERNAN Okay, let's find a back over here. See
that.

SCHMITT Yeah.

CERNAN Oh, man. Take it a little more east so I
don't have to run into the rim.

CERNAN Okay, how about here.

SCHMITT Okay. You're the driver.

CERNAN Okay, Right there.

SCHMITT Like it.

CERNAN Like it.

SCHMITT Okay, you got it.

CERNAN Not yet. You got some fenders and
stuff.

SCHMITT I have to get my cable. I though you
said I could work on the cable.

CERNAN No. You're putting me further and further
behind.

SCHMITT Don't forget your post.

CERNAN Okay.

CAPCOM Crew is right on the EVA time line.

CERNAN Fans --

SCHMITT I can see a little yellow, that's up
inside. Okay? Supposed to dump.

CERNAN Hinge pins.

SCHMITT Okay.

CERNAN Your's is in but mine is not.

SCHMITT Well - neither's my outboard one.

CERNAN My outboard is in but my inboard is not.

SCHMITT And my outboard isn't.

CERNAN Well.
SCHMITT That's supposed to do it. But it didn't.
CERNAN Let me get the contingency tool and try to
push those things closed.
SCHMITT Okay, be care -
SCHMITT There's a piece of glass I picked up. I'm
going to set it right on the floor of the Rover.
CERNAN Jack, let me get that tool. We got to
get those pins in, I think.
SCHMITT Bob, you got any words on the yellow
pins on the rear chasis.
CAPCOM Roger, the best way to put those in if
you tried bouncing the chassis would be to push 'em with the
contingency tool. I think it's what you are going to do.
SCHMITT That's firm. Did you get that Geno?
SCHMITT Need some help?
CERNAN Nope, well, I found out how to get up.
SCHMITT Did you fall down?
CERNAN Well, this thing was in the mud down
here. We'll find out in a minute.
CERNAN Okay, Jack, got an out one here, huh?
SCHMITT Yeah. we'll try to push it in.
CERNAN Okay. Yours is in.
SCHMITT Good.
CERNAN Till I get mine in.
SCHMITT Want me to get it?
CERNAN Well, yeah. Can you reach it from there?
SCHMITT It's a nice firm - I'll hold in on it.
Almost. A little more. Wait a minute, Let me get it - let me
get it right - okay, push.
CERNAN Its in.
SCHMITT Very good. Why don't you put that between
the seats?
CERNAN Okay. Bob they're in.
CAPCOM Copy that.
CERNAN Okay, now where was I? I got my fender
got the post, better get the seat. Ahhhhh.
SCHMITT Ready. I'm going to take it a little
slower here in a minute.
CERNAN Yeah.
SCHMITT Just a little bit slower in a minute.
The blush is off the rose.
CERNAN Say, your front pin is in. And both
of mine are in.
SCHMITT Okay. (garbled)
SCHMITT Not quite as easy as in the training
building.

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CERNAN Well, it's a case of - knowing how to play
in 1/6 g is what it amounts to.

SCHMITT Okay.

CERNAN Okay, I'm ready on the (garble) -

END OF TAPE

CERNAN Okay, I'm ready on the ... you're locked.
SCHMITT Yes. It's locked.
CERNAN Let me get the seat down. Okay, I got the
console.
SCHMITT Okay, and I got the handle.
CERNAN Okay, mine's pulled.
SCHMITT Mines' pulled.
CERNAN Come on down, baby.
SCHMITT Here it comes.
CERNAN Stiff, but come on.
SCHMITT There it is.
CERNAN Okay, make sure your key locks.
SCHMITT I'm not, you're not all the way down, Gene.
CERNAN Yes. I'm locked.
SCHMITT There you go.
CERNAN Okay.
SCHMITT Okay, I'm locked and secured. Okay.
CERNAN Oh, Jack, I put a little piece of glass I
picked up right by the Rover, here.
SCHMITT Okay.
CERNAN Just a little piece. I'm going to leave it
right behind your foot still. It sparkled at me. I had to pick
it up.
SCHMITT That's your, your sample for the day.
CERNAN I doubt that. And I tell you, OG is a piece
of cake or you 1/6 G if you play it right.
SCHMITT Okay, Gene, you've got, bender, your bend was
good. I checked that. I could see mine too. Mine are okay and
you'll have to check your outside one.
CERNAN Okay, my two pins are good here.
SCHMITT And mine are good.
CERNAN This one isn't quite flushed. Almost fits good.
I'm going to pull your flag.
CERNAN Oops, I bent that one.
CAPCOM BTU expenditure for each crewman averaging
1300 surgeon reports. And Jack this is Houston. Looks like your
water temperature's getting pretty high. You might want to go to
intermediate cooling or slow down or something. Looks like you're
getting a little warm.
CERNAN You hear them Jack.
SCHMITT Yes. I got it. Thank you Bob.
CERNAN Okay, Jack, get that cable, because I tripped
over it coming back.
SCHMITT Yes. I'll get it.
CERNAN Okay. Let's see. Verify hinge pins and seal,
erect seat, seat seatbelt, arm rest is lowered, pull T handle,
console's lowered, tripod apex is gone both sides, tool behind
footrest, that's done.

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front hinge pins are in, erect footrest, extent.

CERNAN front center. Verify BAT covers are closed. They are closed, and let's keep them clean. Man, do these gloves fit good.

CAPCOM Okay, and 17 you're right on schedule.

CERNAN Okay. Thank you Bob. Did you tell Captain America we're on the surface.

CAPCOM Roger. We broke the news to him awhile ago.

CERNAN Okay next spacecraft to power up is going to commence right now.

PAO Rover test drive coming up soon. And then we'll get to television after that.

CERNAN Takes care of that little job.

SCHMITT How's my cooling look now, Bob.

CAPCOM Roger. It's come down quite a bit. You were 86 and now it's down to 75. Looks much better. We didn't want you to sweat.

SCHMITT Well, I'm just a hot geologist, that's all.

CAPCOM Or something.

END OF TAPE

CERNAN Somebody kicked dirt all over the mesa.
Let's see if there is any lights in this here baby.
SCHMITT Okay, getting up and on.
CERNAN Give me a yell when you start to go and
I'll try to be sure to be there with the camera.
SCHMITT Okay.
CERNAN 8 bag is full.
CAPCOM Copy that.
SCHMITT The seat belts fit perfect.
CERNAN Shoot I thought I was going to get to
drive. Man I got so much dust over my visor already I got
to wipe it off. Get that lens brush I want you to dust me
off a little later, Jack.
SCHMITT The lens brush?
CERNAN Well, I've got to dust my visor off with
something.
CAPCOM Roger, don't use your glove or dust
brush there.
CERNAN No, we'll use the lens brush, Bob.
CAPCOM Roger.
CERNAN Okay, let's try to see if I can read in the
sun now. Check the hand controller let's wipe it out a couple of
times to make sure we got all the steering. She's wiped out.
She's goes forward and she goes reverse. Came back in for-
ward she's wiped out she's in park. Reverse is down. Okay,
here we go. Stand by for life. It ought to be on this one.
There's life in this here baby. Beautiful
SCHMITT I don't know whose responsible for packing
this ETB, but I think it was me.
CERNAN You didn't by any chance pick up those
scissors did you.
SCHMITT No sir.
CERNAN They are going to be hard to find, but
I think we can do it.
SCHMITT Well, they were right down there unless
you picked them up that's exactly where the Rover tool was, too,
and I picked it up so they're probably there. I didn't see them
though. Okay, I got my camera.
CERNAN All the breakers closed except nav.
SCHMITT The old 4 o'clock pan. Okay, Houston
amp hours I'm reading 115, amps are at 0 volts are 82 and 82
batteries are 95 and 110 forward motors are off scale low
off scale low and rears are off scale low off scale low.
Houston, you with us.
CAPCOM Roger, we copy that.
SCHMITT Okay.

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CERNAN Clear enable 451 time 1, take it nice and easy.
Here we go time 2. Okay, and that is both I know that.
(Garble). Okay steering go forward to A - boy it's hard to
see in that sun and rear to D - and rear to D. Drive power
four is going to A. I didn't feel any earth shaking rumbles
like I do in the trainer, but let's see what happens. Okay,
Jack I'm going to find out in a minute. Okay - okay here we
go. Okay, the front wheels turn. I can't see the rear ones.

SCHMITT I'll verify in a minute.

CERNAN Okay. I can't see the rear ones but I
know the front ones turn, and it does - -

END OF TAPE

CERNAN Can't see the rear ones, but I know the front one's turn, and it does move. Hallelujah. Hallelujah, Houston. Challenger's baby is on the roll.

CAPCOM Roger. Copy that. Sounds great.

CERNAN And judging ..., judging from the way it's handling, I think the rear wheels are steering too.

CAPCOM That's a first.

CERNAN What do you see, Jack?

SCHMITT Well, you're, wrong angle. Yes. They're turning. How does that grab you. They're turning.

CAPCOM How about that?

SCHMITT Come towards me baby. Looks like it's moving.

CERNAN Oh boy.

SCHMITT Keep moving. Don't run over me.

CERNAN Don't worry.

SCHMITT Man, if they don't like this. How's that. Let me move back, okay. How's the time line, Bob.

CAPCOM As far as I can tell, you guys are right on within a minute or two.

SCHMITT They're just a little high for me Geno.

CERNAN Okay.

SCHMITT I'm not sure I can get it without getting way away.

CERNAN Okay. Don't worry.

SCHMITT Somebody said it was going to be just behind the south fence.

CERNAN Okay, I'm going to take a little spin around here, and I'll meet you at the front end.

SCHMITT Okay.

CERNAN Boy, there's a lot of static though everytime I start driving.

SCHMITT I know what that was over there I think. Let me see. Whee. Okay, Houston. The basic material around the LM is just what I said. A fine grain, medium gray regolith, appearing material that as the standard area population. The craters, though bigger than about a meter in diameter seem to get to rock fragments which I haven't yet learned how to pick up.

CERNAN Okay, Jack. I'd better give them our position here. I think I know exactly where we are now.

SCHMITT Well, once you get them dirty, just like the boys say, it's hard to tell what they are.

CERNAN Okay, Houston, I parked right next to Barjea. And we are from Barjea 12 o'clock, oh you can't see you're looking at the Sun, I guess about 150 meters due west of Barjea and that's why we look so close to Trident. I'm coming right up on Poppy. No question about where I am now. I've got Trident and when I get up there we are abeam of Trident 1, just where I said we were. I'm right at Poppy. We're about 100 meters, just about due west

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CERNAN of Poppy which is almost in line with Barjea of course. But basically on that line, I think between Rudolph and Trident 1. And as I look at it the cross section about 100 meters north of Trident 1. That's the landing point.

END OF TAPE

CERNAN Sure get dirty fast. Jack, that is Trident right here that we walked over to. (laughing) I just got my first initiation to getting very dirty.

SCHMITT You sure did. (laughs)

SCHMITT Where are you? Are you ready to go.

CERNAN I'm coming right around the front now. Houston, did you get that position?

CAPCOM Roger, we copied that, Geno.

SCHMITT And Bob, I'm very firm of that now, I'm almost positive, unless I'm awfully mistaken about Trident, I don't see how I could be from here.

CERNAN At the sacrifice of my cleanliness Houston, the basic bright colored rock type in the area looks very much like a crystobalite gabbros of the - I didn't see crystolalite but it looks like the gabbros in the Maria Basalt sweep. The coarse grained clinopyroxene plagioclase rock.

CAPCOM Okay, we have that.

CERNAN Okay, I'm going to park ah. How about along side - am I gonna screw up that little crater with glass in it if I park there?

SCHMITT Right, we will eventually.

CERNAN Well, there's that one anyway. Let me park right here.

SCHMITT I'm sure we'll find some more.

CERNAN Yep.

CERNAN Where you been?

SCHMITT I fell down.

CERNAN Okay, that's about close enough, isn't it.

SCHMITT Yeah.

CERNAN Okay, she is locked.

SCHMITT (garble) let me get the 15 volt supply.

CERNAN I think this camera is probably a little dirty on the lens.

CERNAN Okay, Houston. We're parked.

SCHMITT Nope. Lens is okay.

SCHMITT I'm covered with the lens brush (garbled)

I want to use it on my viros. Oh, Boy.

CERNAN It just takes a little getting used to the one-sixth, Jack.

SCHMITT Want to put this camera over here right now because it's pretty dirty to put back in the bag. Okay, get to work.

CAPCOM Roger, we copy that guys. You're about 7 minutes from that right now.

CERNAN (gargled)

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CERNAN (garbled)
SCHMITT Okay, we'll catch up.
CERNAN Haven't quite learned how to pick up rocks in my hands yet, Bob. I would of had you a sample. That's why I fell down.
SCHMITT My day will come. Oh, oh, it's an old blue traversed perimeter. Okay. On the plains of Taurus Littrow.
CERNAN What a valley.
CERNAN I'd like to cut down here, through here, with a P-38 sometime.
SCHMITT That'll be the day.
CERNAN Yeah, it will.
SCHMITT (garble)
CERNAN Ya never know.
SCHMITT Friend of mine. Install LCRU, lock posts, don't get that, okay.
CERNAN Get that.
SCHMITT Okay.
CERNAN What's the next big hooker.
SCHMITT The LCRU.
SCHMITT Okay, geopallet is off the LM.
CAPCOM Copy that.
CERNAN Yeah. Ya just got to take it easy till you learn to work in one-sixth g.
SCHMITT Well, I haven't learned to pick up rocks which is a very embarrassing thing for a geologist.
CERNAN Yeah, I look like an elephant stumbling around here.
SCHMITT Careful with the LCRU.
CERNAN One dust cover came off.
CERNAN Careful with that baby. That's a real run.
SCHMITT Boy, you sure do move that Rover around when you do that.
CERNAN Hey, the geopallet is locked on.
CAPCOM Copy that.
CERNAN You're getting pretty good at throwing things.
SCHMITT Already.

END OF TAPE

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CERNAN Man, that thing won't want to go over.
SCHMITT That's because it's not in there. Put it
in right, and it goes on.
CERNAN Yeah, the power cable's on to TCU, Bob.
CAPCOM Got that.
CERNAN TGE is on. Two, two -- oh, you just want
the last ones. Okay, 07.
CAPCOM Okay. Copy that.
CERNAN 07.
SCHMITT God, the dirtiest checklist in the world.
Didn't take long, did it?
CERNAN Doesn't take long.
SCHMITT Man, it sure did -- look at that go. Did you
see that?
CERNAN Wish you'd be more careful.
SCHMITT What?
CERNAN No, no, no, not the television camera.
SCHMITT Okay.
CERNAN It's warm out here, you know?
SCHMITT Certainly glad I got cool. Okay, the TCU is
locked in.
CERNAN Houston, I've seen an awful lot of rocks.
SCHMITT If I worked here they look just like the
pyroxene gabbros that I mentioned. The pyroxene's irridescent
in the bright sun. The grain size is about oh, between, maybe
the mean is 2 millimeters, with max maybe up at 3 or 4, and
it looks like predominantly a pyroxene plagioclase rocks, (garble)
plaba parosene, but I haven't looked at it real closely.
PAO Cernan mounting the television on the Rover
now.
CERNAN Okay, Jack, I set the rake on the --
SCHMITT Beautiful.
CERNAN On the seat. I just haven't learned -- I'm
getting finesse at it now. I think you can overwork yourself
instead of making use of the one-sixth gravity.
SCHMITT Yeah.
CERNAN Believe it's going to take a whole EVA to
get familiar.
SCHMITT Well, I hope it doesn't.
CERNAN I find that I'm using my arms almost as much
as I ever did. I remember the last time I was on the Moon, about
2 hours ago --
SCHMITT Okay, guess what? That old hammer goes to
the gate top.
PAO Schmitt is loading tools onto the Rover.
SCHMITT Handle hammer. What more could you want?
CERNAN Okay, Bob. I'm getting a low gain out now.
CAPCOM Okay. Copy on that.

SCHMITT Sounds like the Rover, huh Geneo-o?
CERNAN Beautiful. I just couldn't feel it murmur
when I pressed the breakers in. I could feel life in it but -
SCHMITT Hey, you let me down, sport, you let me down .
There's a pin you didn't pull.
CERNAN Okay, I'll let you get that - keep you
honest.
SCHMITT Not only keep me honest - there -
CERNAN Okay, where am I?
CERNAN Gnomons an island.
SCHMITT Actually, up here it's a geometric reference
for photogramat - grat - photogrametry.
CERNAN Would you believe that the doggone' antenna?
Here, Jack, when I bend this -
SCHMITT Okay.
CERNAN Pull the antenna.
SCHMITT Rather awkward.
CERNAN Pull the antenna. I gotta open it up to get
it out.
SCHMITT Okay. Big connector, you know.
CERNAN Yeah, connector was wedged in there.
SCHMITT Well, that's probably the way it was designed.
CERNAN Boy, don't drop any of those connectors on
the -
SCHMITT Look at that go.
CERNAN - in the dust. We'll never clean them
out.

END OF TAPE

SCHMITT (Hum)
CERNAN Good things we're well coordinated human beings.
SCHMITT Man, I can't believe - yes I can.
CERNAN Okay, let's see - do it right now. Yes, I can. Which way are you going to put it on?
SCHMITT Well, I thought I would put it on that way so I will put it on this way because that's probably right.
CERNAN If you put it on right you're going to disappoint me.
SCHMITT Oh, I hate to touch - touch the old gnomon. I'll do my best.
CERNAN Very best then we'll -
SCHMITT Okay, Bob the low gain is -
CERNAN - will never forgive me.
SCHMITT - low gain is hooked up.
CAPCOM Okay, we copy the low gain hooked up.
PAO EVA has been underway an hour and 3 minutes, now.
SCHMITT (Hum) The rake - the rake is on the extension handle.
CAPCOM Roger 17.
SCHMITT My king - my kingdom for a scoop.
CERNAN The scoop is on the extension handle. Different extension handle's of course.
SCHMITT Go ahead, Bob were you calling?
CAPCOM Roger and your exhuberance is showing up on the BTU's. Your running a little high on those.
SCHMITT Okay.
CERNAN Exhuberance! I've never been calmer in my life (garble). Okay, let's get - we'll take it easy, Bob. I think it's a great part to just get accustomed to handling yourself in zero gravity. The only vice on the Moon.
CAPCOM Rog, I thought you were at 1/6th g.
CERNAN Yes, you know where we are whatever.
SCHMITT Okay, old sample bag -
CERNAN Sample containment bag - sample collection bag or whatever. What is this thing - crazy - come on. Okay that's there. Some of the simplest things in the world you forget. Okay this one right this time.
SCHMITT He did a great job of parking so I was standing in a hole.
SCHMITT Going to mess up all those good looking craters around here. Hang on there accessory staff. Accessory staff, huh? Most staffs are accessory I've learned.
SCHMITT Okay, Bob the high gain is up and connected.

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CAPCOM Okay, copy that, beautiful.

SCHMITT And raised -

CERNAN Okay.

SCHMITT Cable (garble) staff. (garble) might get
your TV camera.

CAPCOM We're waiting with breathless anticipation.

SCHMITT Ah, let's keep them - well, how is my
cooling doing? I'd like to stay on intermediate, Bob, I
feel pretty comfortable I'm not cold but - -

END OF TAPE

CERNAN How's my cooling doing? I'd like to stay on intermediate, Bob. I feel pretty comfortable. I'm not cold, but I'm pleasant.

SCHMITT Pleasant?

CAPCOM We find no problem, your option, Geno.

CERNAN Okay, I just don't want to run out of consumables about 6 or 7 hours.

SCHMITT Your about as - Oh well. Okay. I don't think it makes any difference. You got to use the heat. Matter of fact, that's one of the little know facts of this business Gene.

CERNAN Okay, here we go. Coming up. I've got the TV camera in my hand, Bob. Oh man. Hey Jack, just stop. You owe yourself 30 seconds to look up over the South Massif and look at the Earth.

SCHMITT What. The earth.

CERNAN Just look up there.

SCHMITT You seen one Earth, you've seen them all.

CERNAN No you haven't, babe. When you begin to believe that. Come on camera go in there (garble).

SCHMITT I'll look in a minute Gene, but I tell you once I start this little operation, if I don't finish it, it never gets done.

CERNAN Okay, get in there. Okay, that's in there. That's in there. Camera is locked down. Okay, TCU, sun shade the camera and then the cable. Okay, let me get the sun shade.

SCHMITT That's always more of a job than it ought to be. However, SCB-3 is on the handhold.

CERNAN I got to get smarter about one-sixth g.

SCHMITT That gate works great. Snaps in, snaps closed with the slightest flick of a coordinated wrist. Where is that camera anyway.

SCHMITT Oh, it's over here. Oh, Boy. I just still barely see the scissors. I ought to get those.

CERNAN Yes, but when we go (garble)

SCHMITT I'm not sure I can.

CERNAN Okay, don't, okay, we'll get them when we get the tongs out Jack.

SCHMITT Yes.

CERNAN There are some tongs in the Rover and I'll come over and get them in a minute.

CAPCOM Roger Challenger. And we refrained from mentioning that to Ron.

CERNAN Tell him I hope he's enjoying our scissors. Okay, Bob, the TV is connected To the TCU electrically. The

CERNAN sun shade is on. I've got to deploy the high gain. Okay, now, well let's see how smart you are. That was a pretty good attitude to park at. Okay, Jack is the high gain away from my antenna. Can you see?

SCHMITT Let me turn around. Yes. You're clear.

CERNAN Okay, it's locked. Locked. Now let me see if I can find beautiful big dot up there. I know what I'm going to have to do. I'm going to have to get the, oh, I got it right there. Might be able to peak that, but I got that.

SCHMITT You hit it, huh?

CERNAN Put my hand over it so I could see it.

SCHMITT Yes, that's an interesting problem. The SE feet won't stay up.

CERNAN How about that piece of (garble) Velcro there.

SCHMITT That's just what I'm working on there. Great minds think alike. Okay, that goes in there. The trouble is to reach it, I've got to ...

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SCHMITT That's just what I'm working on there. Great minds think alike. Okay, that goes in there. The trouble is to reach it, I've got to ...

END OF TAPE

CERNAN Okay, I'll bet you it says put mag bravo.
SCHMITT Oh, yours is in a circle.
CERNAN Okay, check LCRU. Deploy LCRU with antenna,
okay. Deploy LCRU with antenna. Blankets open one hundred
per cent.
SCHMITT Come on baby open. Ponna, it goes.
CERNAN Oh, are those mirrors nice, I ope they stay
that way for a while.
SCHMITT They wont. John and Charlie know
exactly what we're talking about. Mark my word.
CERNAN Okay, I'm going to close the circuit
breaker, Bob. Okay, circuit breaker is closed.
CAPCOM Copy that.
CERNAN Power switch is internal. Power
switch is internal. Okay, let me give you some numbers,
AGC is 3 point 4, temp is about 1 point 8, and power is
about 2 point 1. Okay, power to external.
CAPCOM We copy those, Geno.
CERNAN Okay, power is external. (garble) Mode switch
is going to 2 FM TV, Okay. Man, did peak you out at signal
strike of 40 -
SCHMITT I can't see right now, but I think I've
still got you right in the center.
CERNAN Okay, power switch on to TCU. Okay,
it's on to TCU. Okay, AGC in power. Yes sir, Bob, I'm
verifying at 40, that's a good Navy term, 40 on the AGC.
CAPCOM Copy that.
CERNAN And the TV is all yours.
CAPCOM We've got a picture coming in. Are
you there, Geno?
CERNAN I hope. Okay, I'll give you a power
reading, external, if you want it. I'll give you - temp is
still about 17 and power is about 18 on external.
CAPCOM Hey, we have a picture, 17, we have a picture.
CERNAN You have. Beautiful, babe, it's all
yours. I hope it moves now.
CAPCOM It does.
CERNAN I hope it moves. You'll find out -
hey, it moves, it's alive. You'll find out - hey, it moves,
it's alive. Okay, Bob, I'm going to get SRC 1.
CAPCOM Okay, could we have a EMU check on you
fellows when convenient?
CERNAN Okay, Commander is 3 point 8 plus. I'm,
oh, I must be 80 per cent and no flags and no tones.
CAPCOM Copy that.
CERNAN Okay, LMP is, uh - LMP is about 80,
let me see - 75, about 80 per cent and no flags, no tones.
I've get 83 per cent.
CAPCOM Okay, copy that and you've sure got a
lot of stuff on the Rover all ready.

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CERNAN Yeah, Mag Helen has just gone into the
bag, into the seat.

CAPCOM Copy that.

PAO That was Jack Schmitt on the screen.

CERNAN Mag Cynthia is in there. Okay, Bob,

SRC 1 is open, Gail is in. Jack, watch these SRCs.

I don't like the lock on this cable very well.

SCHMITT I never have.

END OF TAPE

CAPCOM Okay, and Jack, you did get that.
SCHMITT Okay.
CAPCOM Charlie as well.
CERNAN That's affirmed.
CAPCOM Okay, and we did not copy your cup gage
reading down here.
CERNAN Oh, you didn't? Well, maybe that's be-
cause I didn't give it to you. 3.9. No wonder that's so
much work.
CAPCOM Go ahead, copy that.
CERNAN Okay, Bob, that's tesseau 1 - aw - she sure
wont stay in the base of her (garble) - okay, that will stay
in there. Okay, Bob, it's closed. It sure doesn't seem
like it wants to stay there, though - and the organic sample
has been sealed.
CAPCOM Copy that.
CERNAN I guess you believe we're here now, huh?
CAPCOM Now we believe you're here - we see you
in person.
CERNAN Okay, Bob, the - Bob, the SRC cover will
not stay closed - it just slowly springs up. There's nothing
I can seem to do for it. I might be able to set something -
a blanket - on top or something.
CAPCOM Okay, stand by. We'll get back with you.
CERNAN Okay. I'm putting - yeah it just flops
open - I'm taking. I'm taking SCB 1 through Tool Gate. I'll
get me a hammer and I'll give you a gravimeter reading.
SCHMITT No you won't. Not until you're done. I'll
go get the flag there. Guess what? We're here again.
PAO Cernan has the red band around his arm.
SCHMITT The buddy sledge is on the Rover. Okay,
ETB - Okay, CDR's camera - film magazine I had to work on a little
bit to get it to work but its working.
CAPCOM Copy that.
SCHMITT If I get that camera you can punch the
gravimeter (garbled)
cERNAN Okay. Get the camera and I'll give them
a gravimeter reading. Is that all you need? 'Cause I'll go
get the flag.
SCHMITT Okay, you'd better let that - yeah, but
why don't when you go - let me get some tongs, too. We need
to salvage those. -
CERNAN Okay.
SCHMITT - scissors.
CERNAN Okay.
SCHMITT Okay, let me steady the Rover.
CERNAN Okay, Bob. Mark: Gravimeter and the light
is flashing.
CAPCOM Okay, we copy that.
SCHMITT (singing) Oh, bury me not on the lone prairie.
Where the coyotes howl and the wind blows free. -

CERNAN Ah ...
CERNAN Okay, where am I?
SCHMITT You're doing a gravimeter - getting the
flag, I've got your camera - I'm going to salvage the scissors.
CERNAN Okay, get the scissors and I'll be putting
the flag in.
CERNAN And don't go near the Rover.
SCHMITT Don't go near the water. That reminds me
of a good book. -
SCHMITT Ah ... boy ...
SCHMITT I can't go near the Rover.
CERNAN Let me tell you no.
SCHMITT I can't go near the Rover.
CERNAN Why don't you set them -
SCHMITT How about you letting me stick these in
your pocket with your -
SCHMITT Yeah -
CERNAN Just set them in there. We'll get them
when we come back.
SCHMITT Okay. I'll tell you what I'm going to do.
CERNAN Just set them inside the - put them in the
SCHMITT I'm going to hang them here on the hook.
CERNAN Okay, that's good.
SCHMITT Right there.
CERNAN Okay, Jack. How about the flag right over
here in this little mound?
SCHMITT Which mound?
CERNAN Well, let me take a look around -
SCHMITT How about right up there on that little
high point. It's right up in here where I'm going.
CERNAN Yeah. Of course, your idea of a high point
might be different than mine.
SCHMITT I meant the North Massif. (laughter)
CERNAN That's probably the best place in the world
for the flag. Its right up on the top.
SCHMITT Okay, let me come over and help you.

END OF TAPE

SCHMITT Okay, let me come over and help you. (Hum).
PAO The flag they're deploying is the flag that
has been in the mission control center here during past missions.
SCHMITT (Garbled)
CERNAN Yeah. Hey, you're in the edge of the crater
though. That's no test.
SCHMITT Yeah, that's all right. Move right over
here near your tire tracks.
CERNAN Yeah, this is a high point right here.
SCHMITT Yeah, that's good. Right there.
CERNAN Well, that wasn't too bad.
SCHMITT Okay, let me give it a few whacks. Oh, balony.
Okay. Watch your fingers. Now that wasn't too bad. Want to
make sure it stands up. That's getting pretty - I can - well -
we'll - we can prob - hum. (Laughter) Going as far as we can go
(garbled) hit something solid for that one.
CERNAN Naw, it was still going.
SCHMITT Yeah, but did you ever see a vibrator like
that?
CERNAN No, I've never put a flag up on the Moon
before.
SCHMITT What? Pull that in.
CERNAN (Laughter) You'll have to get it down to my
level. Tall guys are all alike.
SCHMITT Wait, I'm not through.
CERNAN Okay. How about getting it stretched out.
SCHMITT I will. I just can't start forward as fast
as I would like to. Hate to touch it, my hands are so dirty.
CERNAN Okay?
SCHMITT Yeah, it's going to want to curl. Maybe it'll
it sort of looks like it's waving in the breeze.
CERNAN Yes sir. How about right there?
SCHMITT Take a couple this way and we'll take a couple
that way. How's that?
CERNAN Oh, I ought to get - let me get over there -
let me get the Rover in the background.
SCHMITT (Garbled) well.
CERNAN It does wave when you do that.
CAPCOM I've got a beautiful picture of you guys
up - down there.
CERNAN Let me tell you, Bob, this flag is a beauti-
ful picture. You see that?
CERNAN Okay, you're - it's partially covering the
Rover, but I guess it's a pretty good shot. How's that? Let
me get the focus right.
SCHMITT I don't know where to put it.
CERNAN There you go. Wait a minute. All right I
got you reaching for the flag. How's that?

SCHMITT That's very good, Gene. Let me get it to stereo.

CERNAN Houston -

SCHMITT That's beautiful. It's got to be one of the most proud moments of my life, I guarantee you. Let you get a close in one and we'll trade cameras.

CERNAN Houston, I don't know how many of you are aware of this, but this flag has flown in the MOCR since Apollo 11. And we very proudly deploy it on the Moon to stay for as long as it can in honor of all those people who have worked so hard to put us here and to put every other crew here and to make the country United States and mankind something different than it was.

CAPCOM Roger, 17 and presuming to speak in behalf of some of those that work on the MOCR we thank you very much.

CERNAN Back right where you were, step to the right. Right there.

SCHMITT (Garbled) I'll keep it down.

END OF TAPE

SCHMITT Get closer. I'm going to get on the other side.

CERNAN Well, I want to get something here.

SCHMITT What's that?

CERNAN I want to get the Earth.

SCHMITT Oh, okay. Let me get over here -

CERNAN Get around on that side.

SCHMITT I don't - I don't think it's going - you're a little close, maybe. Get them both in focus.

CERNAN That might do it.

CERNAN Try that one time, then we'll give up and get to work.

SCHMITT Higher up a little -

CERNAN Yeah.

SCHMITT Let me try it again, okay? I don't know, Geno-o, okay? Let me get over here closer to you. Okay. That might have got it.

CERNAN Okay, very good.

SCHMITT Okay.

CERNAN Alright, looks good. You think your gravimeter's ready so I can go back there?

CAPCOM Roger, 17, the gravimeter's ready and a couple of words here. One, I presume you found the scissors, right?

SCHMITT Yessir.

CAPCOM Okay. Two -

CERNAN Not Ron's, we found ours.

CAPCOM Roger, and the main thing is we do want the SRC closed and if you can possibly latch it - I'm not sure that's easily done - that would be one solution. The other would be to put something on top of it to hold it closed.

CERNAN Okay, Bob, I'll find something.

CAPCOM Okay, copy that. Four of the brackets off the maze would be something or a rock that's nearby is another possibility.

SCHMITT Okay, Gene, what are you going to be up to now?

CERNAN I'm going to go get the -

SCHMITT (garble) pallet?

CERNAN Pallet.

SCHMITT Okay, why don't I give the old inspection here bit, and I really ought to have my camera, shouldn't I?

CERNAN I need a -

SCHMITT Yeah.

CAPCOM Roger - that's affirmative.

CERNAN (garble) on this.
SCHMITT What would you just -
CERNAN Well, I'll find something.
SCHMITT I'll take the old CDR's camera. Not a bad camera to take.
CERNAN Jack, I'm going to take the old gunny sack here and put it over - that'll hold it down.
CAPCOM I presume you're talking about the big bag, Gene.
CERNAN Yeah, the big bag that was on the ladder. That's all it needs. It's just a little bit, just enough spring force in it. Okay, Houston, I think you've had all the good words about the LM. We have never flown a better LM. I guess that's safe enough to say. The quads look great, the old steering wheels were aimed right at you. Driver radar's in good shape in part - looks like parallel to Z. Just about perfectly. There's no visible - I'm on the 3 o'clock position plus Y. No visible contamination. There's a little bit of discoloration of the plume shield below the bustard. The engine bell never touched the ground. It's about, oh 15 centimeters off the ground.
CAPCOM How's that for coming down gentle?
CERNAN That's what you call okay number three wire Jack.
SCHMITT Hey, we never heard what our landing parameters were.
CAPCOM We'll worry about that later.
CERNAN (garble) now that we're here.
SCHMITT Oh, but they always - they always give them to us in the simulator. Hey, Bob, judging from what I see on my clock, we're not but about 5 minutes behind.
CAPCOM That agrees more or less with the way we read it.
SCHMITT Gene had a little forward motion as I think you read his call, and that shows up in the forward foot pad at any rate, or did. It looks like he may have tail first a little bit. That's embedded to the full pad depth. I see no - oh, by George, Gene, you may have had a first. I think you stroked that thing.
CERNAN I stroked what?
SCHMITT The rear - the rear landing gear.
CERNAN Well, we can measure it and find out.
SCHMITT I'll take a picture of it. May have stro -

END OF TAPE

CERNAN Just stroked it. The Mylar, the lower orange Mylar, is folded a little bit.

CAPCOM Roger. There's word floating around down here about a typical Navy landing, but I'm not sure whether we believe it or not.

SCHMITT He caught his tail hook. Say, Bob -

CAPCOM That's the best way.

SCHMITT - Just behind the LM in that very fresh crater I picked up an example of the kind of gabbro I was talking about and I'll stick it in the big bag - except the big bag has disappeared.

CERNAN Okay, I've got to give you a reading, Bob, if you're ready.

CAPCOM Ready.

SCHMITT You put the big bag up -

CERNAN 670 003 101. That's 670 003 101.

CAPCOM Okay, we copy that.

CERNAN Jack, I put that there to hold the SRC down.

SCHMITT Okay, I just put our sample in it. It's in the bottom bag. It's about 8 by 5 centimeters by 3 centimeters. Slightly tabular.

CAPCOM Okay, we copy that from the big bag.

CERNAN Okay, okay, Bob. A mark on gravity.

CAPCOM Copy that.

CERNAN And the light is flashing.

CAPCOM Copy that.

CERNAN Aw ... I've got to tell you, Bob. I haven't done everything there is to do in the Navy, but deploying that Flag has got to be the most proud thing I'll ever do in my life. If you could see you and you could see it from where we are I know you'd feel the same way.

CAPCOM Roger on that.

SCHMITT Whew - (laughter)

CERNAN God, its pretty up there. God you're pretty up there over the top Massif. Beautiful.

SCHMITT Hope nobody saw that.

CERNAN Beautiful.

SCHMITT Oh, they were watching me. (laughter) Those finks.

SCHMITT Okay, you weren't doing anything with this gravimeter on here, I hope.

CERNAN No, its on the deck.

SCHMITT Okay.

VAPCOM Okay, you might grab me a (garble) when you set it on there, Jack.

SCHMITT Too late, Bob.

CAPCOM Okay.

SCHMITT I'll get it later.

CAPCOM Okay. We'll get it later, no hurry.

CERNAN Okay, now - Let's see yow to get this off. You've got to educate us again.

SCHMITT We may not remember those -

CERNAN Bob, the sceptre's in hand.

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CAPCOM Roger on that.
SCHMITT Okay. I'll give you a temperature. Let's
see where this fits. I'll bet it does.
PAO They're unloading the surface experiments,
now.
CERNAN Come on, lock, baby. Okay, it's On - Lock.
CAPCOM Copy that, roger.
SCHMITT Okay, Bob. Here's a temperature for you.
40 degrees.
CAPCOM Say again.
SCHMITT 40
CAPCOM Copy that.
CERNAN Both covered. Okay, number 1 - something
over here - never did figure out what - Okay, Bob, the shade
is deployed facing deep space.
CAPCOM Oh, copy. Roger. Understand the cosmic
rays.
CERNAN Okay, Bob. The antenna is deployed. It's
not on the post yet, but it's deployed

END OF TAPE

CERNAN - not behind the post yet, but it's deployed.

SCHMITT Oh, oh, come on, don't get, don't get all caught on something. That's better, that's better.

SCHMITT Okay, Bob, I think just about got a, the sun side deployed, just as perpendicular to the sun as I think anybody could do.

CAPCOM Okay, copy that, good enough.

CERNAN Okay, I don't have any pictures yet, so you might put that down as something to get later.

CAPCOM Yeah, we'll cast that in the pan with the next EVA or something like that.

SCHMITT Man, if that - Boy, if that antenna doesn't get some noise from outer space, I don't know what will, if they are out there, and they are I'm sure, they'll see that one. That is even weirder looking out here than it is in the high bay. Hey, Bob, before we leave the ALSEP remind me to check the cosmic ray, I might hit it here in the process of deployment.

CAPCOM Okay, try not to.

SCHMITT I got a little close.

CAPCOM Okay.

CERNAN Oh, I will. Okay, the doors are open, beautifully.

SCHMITT I don't know what talent you have for landing in holes, Cernan, but once again I'll be doing all the ALSEP work in this hole.

CERNAN Okay.

CAPCOM Are you saying we should have kept the pulleys there, Jack?

SCHMITT Yeah, I need the pulleys. Pulleys.

CERNAN You know, Bob, I've got a little bit of a problem here. I've got the set connector on (laughter) but it - it'll slide down in, but the locking cover just wont go over.

CAPCOM Roger, Geno, understand it slides in far enough, you think it's alined huh?

CERNAN Yeah, I'm positive it's alined, it just doesn't appear to lock over, well not appear, it just won't lock over, I'm shoving it home. Okay, I got it, I got it, makes everyone happier.

CAPCOM I'm glad we have the right solution to that one, Jim.

CERNAN The right solution due to the fact that you've got a man here doing it.

CAPCOM Laughter.

CERNAN Okay. Hey, Bob, the ECA 10 monitor switch is on.

CAPCOM Copy that.

PAO Cernan working with the surface electrical properties receiver on the Rover.

APOLLO 17 MISSION COMMENTARY 12/11/72 CST 19:30 GET 118:36 MC 453/2

SCHMITT There's an easy way and a hard to do
everything, don't know why we don't do it the easy way.

SCHMITT Payday. RTG is on the surface.

CAPCOM Copy that.

SCHMITT Central station is (garble) Gene's
little pet job makes these things slide out by themselves
almost.

CAPCOM Better thank him next time you see
him.

END OF TAPE

CERNAN Okay. Hey, Jack, you know there's none of those guys up there holding those hoses as we go around the LM.
SCHMITT What do you mean? I saw one just a minute ago.

CERNAN Okay, Bob. You want 4 5 6 and 7.
CAPCOM That's affirmative.
CERNAN Okay, 4 5 6 and 7 it's coming off.
CAPCOM Roger on that.
CERNAN Okay.
PAO That was a reference to the help they have during simulation.

CERNAN Just took time out for a snack and a little water.

CAPCOM Okay.
CERNAN Okay. How's the TV working?
CAPCOM Beautiful.
CAPCOM To coin a phrase, it is a panoramic scene of beauty.

SCHMITT Oh, come on now, Bob.
CERNAN Say, Bob, what do you think of the terrain?
CAPCOM Looks flat. Very flat and smooth.
CERNAN That's why you're an astronomer.
SCHMITT That's why you're - (Laughter) Oh, well.
CERNAN Okay, give you a reading on the TGE if you're ready.

CAPCOM Roger, ready.
CERNAN Oh, don't kick dust on it. Hope I can read it down here. Okay.

CERNAN Okay, Bob, you're going to have to bear with me. When I leaned over to punch it, I hit gravity instead of read, so I guess I got to wait it out.

CAPCOM Okay, we'll set the timer again.
CERNAN Okay, I'll - I should have been more - more careful. Okay. Orient pallet to the sun. If you can see it, it's directly at the sun so that ought to be good.

CAPCOM Okay, copy that.
CERNAN The SRC doesn't have to be all the way closed does it?

CAPCOM No. Not all the way just as long as it's most of the way closed. You can have a crack there in the top.

CERNAN Okay, that's what it is. Man I'll tell you, This - this thing got low all of a sudden. How're you coming, Jack?

SCHMITT Great.
CERNAN You get it fueled yet?
SCHMITT Oh no. Okay, coming soon though.
CERNAN Let me know if you have any problems with that.

SCHMITT All right I will.

APOLLO 17 MISSION COMMENTARY 12/11/72 GET 118:40 CST 19:33 MC 454/2

CERNAN Okay, come on bag. You're all I got. Man I - there we go. Da de de de. Bob, that gravimeter went right to steady (garbled) went right to steady, so I don't expect it'll be too long.

CAPCOM Okay, I'll give you a call in a couple of minutes there. I'll be done.

CERNAN Okay.

CAPCOM And Jack, I understand you have the RTG fueled?

SCHMITT Negative.

CAPCOM Okay.

SCHMITT I'm supposed to call you when I have it fueled.

CAPCOM Okay.

CERNAN Jack, do you have a - am I missing a map I should have up here? There should be two maps - there under the seat. I put them in there so they wouldn't bounce off.

SCHMITT I'm sorry, I forgot to tell you.

CERNAN Okay, I got them.

CERNAN Hello, Houston.

CAPCOM Hello, Challenger.

SCHMITT I wish I could go back and make that landing about 6 or 7 times so I could take in all that I missed.

CERNAN So do I. I might as well stayed at the Cape. Okay. Let's see. Core borer neutron flux -and I'll get the -

CAPCOM Geno, You know you might wander by the gravimeter, I think it might be done by now. You might just check the light and see if it's steady or on or not.

END OF TAPE

CERNAN Okay, I'll go by there right now, Bob.
For future reference, Bob, the dome removal tool doesn't - it'll
turn - oh shoot.

SCHMITT Okay, Bob, it's me. It's not lit. Can I
take a reading?

CAPCOM Rog, if the light's out, give us a reading.

SCHMITT Well, let's see if I can push the right
button this time. Okay, it's 670017201670017201 and it's about
75 percent in the shade of the Rover.

CAPCOM Okay, I copy that, and now we're ready for
bias.

SCHMITT Now, you want - okay, a bias coming at you
on the ground, correct?

CAPCOM Roger.

SCHMITT It's blinking, Bob.

CAPCOM Okay, copy that.

SCHMITT I've got the core bag and an (garble)

SCHMITT Gene, I need your hammer.

CERNAN Okay, you need my help. Okay, coming over.
What's your problem?

SCHMITT Well, the dome removal tool never latched
into the dome but it turned it. I think it's pretty badly
chewed up. I'm not sure what happened. Let me have your hammer.

CERNAN (garble) Oh, boy.

SCHMITT So, let me have your hammer. I'm going to
have to pry off the dome.

CERNAN Can't you -

SCHMITT No, I, I, you see I stripped it, I think-
(garble) I can do it.

CERNAN No, wait a minute, wait a minute, wait a
minute - let me -

SCHMITT See, it's stripped. See, but it's open -
wait a minute - see, no wait - see. Just put your blade in
there, don't touch it. Put the blade in there and pry. It'll
come, I hope.

CERNAN Here, let me get it once from this side.
Can I -

SCHMITT Gene, don't get so close. Move your hand.
There, you got it, nice work.

CERNAN Okay, it's off. It's off.

SCHMITT Nice work.

CERNAN Whoo.

CAPCOM Roger, once again we have the right solution.
(garble)

SCHMITT I'm not sure, Bob, what happened. You might
ask them that if you only partially get the dome removal tool
on, if you can strip the whole thing out.

CAPCOM Okay, we'll look at it (garble).

APOLLO 17 MISSION COMMENTARY 12/11/72 GET 118:45 CST 1939 MC 455/2

SCHMITT It won't make much difference any more.
CAPCOM We'll make sure of it's change on the next
dome removal tool.
CERNAN Bob, I'm just taking a breather.
CAPCOM Okay, we're watching you.
SCHMITT That was a strange one, Gene. Did you see
how I mangled that thing?
CERNAN Yeah.
SCHMITT I tell you our TG is out. Don't trip.
CERNAN Wouldn't think of it.
SCHMITT Okay, where was I? I got to go back
and get the drill if I'm not mistaken. Yes sir, and then I'll
be caught up with TGE.
CERNAN Okay, Houston, the RTG is inserted. The
(garble) that is -
CAPCOM Okay, we'll copy that.
CERNAN Bob, I'll give you my word. Before we leave
here, I'll make sure that the SRC is closed.
CAPCOM Okay, copy that. As long as it's got only
an inch or two showing there, there should be no problem. That
looks fine (garble).
CERNAN Yeah, I've got to put something on it to get
it down there that far.
CAPCOM Okay.
CERNAN Okay.

END OF TAPE

CERNAN Man, that came out like a dream. Man,
is this Mesa low when you - come on baby.
SCHMITT I think you made (garbled)
CAPCOM Roger. Copy that.
SCHMITT I'm checking out the cosmic ray. Cosmic
ray looks good.
CAPCOM Beautiful.
CERNAN Oh, I "snuck" a quick peak at the drill
and it does work.
SCHMITT What in the world is that?
CERNAN That's Ron.
SCHMITT Ron?
CERNAN That's Ron.
SCHMITT Got his VHF on that Fink.
CERNAN Hey, you might tell Ron that we can hear
him.
PAO The command module is over the landing site.
CERNAN Okay, drill LMP seat - good seat belt. -
Ron, you still with us?
SCHMITT Okay, ALSEP is put together in a bar bell
mode and Charlie Duke I have checked it and it is locked.
CERNAN Hello, there, Ron. If you read we're
reading you.
CERNAN Well, (singing) "We're off to see the
Wizard".
SCHMITT Hey, do you need me, Gene?
CERNAN Nope. I'm going to go deploy an ALSEP.
SCHMITT Have at it.
CERNAN First, I've got to find that ALSEP site.
SCHMITT Don't fall into Camelot.
CERNAN Okay, Bob. I'd like to read a TGE.
CAPCOM Roger, you're ready to read the TGE -
we are.
SCHMITT Oh, you won't believe it.
CERNAN You did it again.
SCHMITT Oh ... there goes a fender.
CERNAN Oh ... Sh--t.
SCHMITT Say, Bob, I'm moving down sun.
CERNAN Well, I'll get that in a minute.
SCHMITT I'm moving down sun and where we've
walked we stir up darker material ... just slightly, but its
darker. The same old thing, the most regular type.
CAPCOM Okay, copy that. Have you got bias reading
there, Gene?
CERNAN Yeah, I'm giving it to you right now.
337 454 001 - its 337 454 001
CAPCOM Okay, we copy that.
CERNAN I hate to say it but I'm going to have
to take some time to - I'm going to have to try to get that
fender back on.
CAPCOM Okay, was it the rear fender, Geno?
CERNAN Yeah, caught it with my hammer and it
just popped right off.

CERNAN Bob, for future reference - its a piece of tape putting the TGE on.

CAPCOM Okay, copy that.

CERNAN Jack, is the tape under my seat, do you remember?

SCHMITT Yes.

CERNAN I may need it. Okay. Let's set my dark side canister to middle - I'm in max - max cooling. Man, you're romping around like a - how are you doing?

SCHMITT Oh, fine. It's just - it's work going out here.

CERNAN Yeah, I'll bet it is. Just take it easy.

SCHMITT I am.

CERNAN I'm going to be a little bit behind you if I have to work on that fender anyway.

CAPCOM Yeah, you can walk a bit more slowly than you're walking, Jack.

SCHMITT Okay, more and more - what's that?

CAPCOM I said that you can walk more slowly than you started out anyway.

SCHMITT Bob, essentially, some of these rock that I believe - gabbros - have a texture not unlike a welded tuff but I know they're not, but they've got some mottled characteristics to them I haven't figured out.

PAO Schmitt carrying the ALSEP about 100 meters east of LM.

END OF TAPE

CERNAN If it wasn't for that fender I'd be ready to go. Makes me sort of mad.
PAO Gene Cernan will drive out to the ALSEP site in the Rover.
CAPCOM I say there, Jack, that looks like a big rock there beyond you.
SCHMITT That's the one we were talking about earlier.
CAPCOM We believe you now.
SCHMITT Well, I've done this in training. I can't say I'm very adept at putting fenders back on, but I sure don't want to start without it.
CERNAN Well, shcot.
SCHMITT Okay, Bob, I think I'm going to move a little bit to the northwest of my present position in order to get a little farther away from that big rock.
CAPCOM Okay, Jack.
SCHMITT And to get out of the shallow depression.
CAPCOM Roger.
SCHMITT Get out of the shallow depression that's here.
CAPCOM Roger. It's not so shallow - you disappeared out of sight on the last one.
SCHMITT Well, it's shallow relative to other depressions I've been in. You know this ALSEP is almost as heavy as the one we had at the Cape. Uh oh. I lost one of my blocks. Oh well, I'll - I'll get it on a rock, or I'll retrace your steps.
CERNAN Don't worry about that. I'll be able to turn those rocks around and use it.
CAPCOM Copy that, Jack and Gene if you're having trouble with that fender and you think it might be easier with two guys you could wait until you get out to the ALSEP site.
CERNAN No sir, I got it on but a little piece of the rail is cracked off and I'm just going to put a couple of pieces of good old fashioned American gray tape on it - see whether we can't make sure it stays. Because I don't want to loose it. Except good old fashioned gray tape dosen't want to stick very well.
SCHMITT I've not seen any sign of layering in any of the craters - in their walls.
CAPCOM Okay, copy that.
SCHMITT The rocks still seem to be pinkish gray - a pinkish gray gabbro out here.
PAO Gene Cernan taping the fender on.
CERNAN Good old fashioned American gray tape doesn't stick to lunar dust covered fenders. One more try. I think it'll stay for an indefinate period of time right now. Not bad for EV gloves.
SCHMITT Can you see me Bob?
CAPCOM No, we're watching Gene right now. You disappeared out of sight a long while ago.

END OF TAPE

CAPCOM Hey, you just came into sight again, Jack.
CERNAN Hey, there'll be enough room to deploy
the heat flow.

SCHMITT I'm going to, I'm looking for a place,
away from creaters and rocks.

CERNAN That's why I didn't land up there.

SCHMITT Okay, I think I've got a place and I
think it will also give you a spot for the neutron flux that's
sheltered from the RTG.

CAPCOM Okay, you say you have a place like
that, Jack?

SCHMITT Well, I - pretty much, I think, Bob.

CAPCOM Okay.

SCHMITT Let me work on it here a little more.

CAPCOM Okay, and right now you're about 10
minutes behind the time line, Jack.

SCHMITT Okay.

CERNAN Bob, I'm only going to spend another
minute or two on the fender.

SCHMITT Okay, chuck.

CERNAN I never thought I'd be out here doing
this.

SCHMITT Boy, I'll tell you, Geno, I tell you,
I'm going to go back this way. Central station can be near
a crater, it will be pretty good, that'll put the LEAM right
out over there, which is probably all right. The perimeter
out over which is probably all right. Kind of puts your
drill holes a little to close to that rock, though. Bob,
ask Mark if he's worried about rocks as much as craters.

CAPCOM Okay, stand by.

SCHMITT We've got a rock about 2 meters in
diameter, partially buried, that one of the probes may be
near.

CAPCOM Stand by. Define near.

SCHMITT Well, it could be 10 feet.

CAPCOM Okay.

SCHMITT Well, I can move a little more south
I guess.

CAPCOM Okay, and Jack, it seems like, you're
about 3 meters from the rock, that's no problem.

SCHMITT Okay, okay, this is it.
CAPCOM Okay, copy that.
SCHMITT I tell you the block - the - let's see
the sun's south, this way, south of east, okay, ah shoot.
CAPCOM What's wrong.
SCHMITT Well, it's just about impossible - Bob,
it looks like the probes are going to be in a shallow depression.
I'll try to improve that a little. It's not a real crater,
it's just a shallow depression.
CAPCOM Stand by, stand by on that, Jack, a
minute, that may be okay. Okay, shallow depression's
all right, Jack, don't worry about it.
SCHMITT It's not more than a meter deep.
CAPCOM That's okay, Jack. Stay there.
SCHMITT All righty, it looks pretty good to me.
CAPCOM Okay, good enough.
SCHMITT Just - Bob, it's really in detail.
The meter and half meter scale we read is a little
more than we can stand here for a good site, but I think,
I think this will be all right.
CAPCOM Okay, copy that. We're ready to press
on with ALSEP interconnect. And Geno, how are you doing on
that fender.
CERNAN Bob, I am done. If that fender stays
on I'm going to take a picture of it 'cause I'd like some
sort of mending award, it's not unique but tape and lunar
dust just don't hang in there together.
CAPCOM Okay, copy that.
CERNAN Well, let's hope. Keep your fingers
crossed and I'll be more careful around the fenders.
CAPCOM Okay, copy that.
CERNAN Whoops. Bob, I'm going to do one other
thing real quick here. I've got to dust my visor off.
SCHMITT Gene, do you want me to do that?
CERNAN No, I can do it. I'll just do it right
here, only have to do it in a couple of places right in
front of me. That didn't do much good, did it. Someone
should have told me that. That just really screwed it up.
Okay, Bob, you might ought to be thinking of a good way to
clean that visor when I get in the cabin.
CAPCOM Okay, we'll put someone on that.
CERNAN Okay, LM on with the equipment check.
Blankets are open one hundred percent. TV sun shade is on, set
receiver antenna nav cable. We've got 4, 5, 6, and 7 on the
charges. TGE. I've got premeasure on complete, I've got the
drill, the bag and the neutron flux, the TV camera, I'm
taking it away from you.
CAPCOM Okay, Roger.
CERNAN Sorry about that, Ed. Okay, mode
switches going to 1.

APOLLO 17 MISSION COMMENTARY 12/11/72 CST 19:52 GET 118:59 MC 458/3

PAO We'll loose the picture while Gene Cernan drives the Rover out to the ALSEP site. Get a picture back very shortly after he's parked the Rover.

CAPCOM (garble) reading, those are a little high and we'd like to try and clarify some of that stuff.

SCHMITT Boy oh boy, yeah, I get you, Bob. Boy oh boy, you just got to be careful where you (garble) boy, don't do that again.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/11/72 GET 119:06 CST 2000 MC 459/1

SCHMITT Yeah, Bob, I thought they were a little high, too.

CAPCOM Roger.

SCHMITT Okay, about temp. 100 and 120 - right now.

CAPCOM How about tapping the meter a little bit for us. Jack, how about tapping the meter a little bit for us.

SCHMITT Yeah, I think the meter's been tapped since we've been working on the Rover. Yeah, 100 and 120.

CAPCOM Okay.

SCHMITT Okay. Get this baby started.

PAO We're 2 hours and 5 minutes into this EVA.

CERNAN Okay, Jack, I'm on the way.

CAPCOM Okay, and Gene-o, we'd like to vary the parking a little bit because of this. We'd like to try and get those batteries cooled down because of this. You can park about 50 feet north of the Central station. And facing east down sun that will open the battery covers.

CERNAN Okay, Bob, I can't read you, but facing east and down sun are not the same.

CAPCOM Well, approximately there.

CERNAN Jack, you need your block? I got it right here.

CAPCOM Facing -

CERNAN You're on the Rover, aren't you?

I got it, wait a minute.

CAPCOM Hey, Gene-o, we mean up Sun. Sorry about that.

CERNAN I got your block covered, Jack.

SCHMITT Okay. Boy, it doesn't take much to get those battery covers dirty.

CAPCOM Okay, Gene, did you copy that we meant facing up sun?

CERNAN Yeah, Bob.

SCHMITT What did you do, get (garble)?

Okay. I got that.

CERNAN Bob, the dirty plug meter is 90 percent scale to the right.

CAPCOM Okay, copy that. Did you copy that?

CERNAN Okay, Bob, give me that parking data again, would you?

CAPCOM Okay, we'd like you to park facing the sun. How's that for being definite.

CERNAN Okay.

CAPCOM About 60 feet north of the central station.

CERNAN 60 feet north of central station - I can't park a little northeast? Now okay, you want the battery covers

open?

CAPCOM That's affirmative, Gene. And that means you will have to dust them before you open them.

CERNAN Yeah, I guess so. Hey, am I glad I didn't land up here, Jack.

SCHMITT So am I.

CERNAN Okay, ALSEP is connected, RTG is connected. Is that where you're going to have the central station, huh?

SCHMITT Well, Gene-o, that's the best I can do but I've spent a lot more time.

CERNAN Yeah.

SCHMITT And let me talk to you about it. And ask about this depression.

CERNAN Yeah.

SCHMITT Your probe's alright out in here and if you get in the bottom of it for the - either this one or go out there - especially in the straight line between you and me now, another depression would be good for the neutron flux. You need to be over that way - you're just a -

CERNAN Yeah, they want me to park about here - where -

SCHMITT You need to be over here. First central station, right there, huh? You need to -

CERNAN Yeah, I've got to park in that sun for the batteries.

SCHMITT Oh, okay.

CAPCOM Okay, 17, for your planning -

SCHMITT Okay, about 60 feet northeast. How does it look behind you.

CAPCOM Okay, 17, to your planning - you're about 20 minutes behind the time line -

SCHMITT That's good, Gene. That's good.

CAPCOM We're now about at the timeline.

CERNAN You're cutting out now, Bob, you'll have to wait.

CERNAN What are you, Bob?

CAPCOM Roger, we're about 20 minutes behind the timeline, 2 zero minutes.

CERNAN Okay. Yeah, I guess it could be worse considering a couple of things. Okay, about time I got those batteries. Okay, Jack, let me give you this first, so I can get to work.

SCHMITT Oh, the block.

CERNAN Yeah.

SCHMITT I'm sorry, I forgot you had it. Thank you.

CERNAN Okay, where are we? (garble) okay. 15 volt is off, let me doublecheck that while I was thinking of something. I wouldn't want this Rover to go rolling over the terrain without me. Okay, it is off. On switch position 3, dust CTV and the whole works, huh? There is TV remote. Okay, Bob, you're alined on the high gain.

CAPCOM Okay, we copy that. We copy that.

CERNAN And you're in position 3.

CAPCOM Copy that.

CERNAN Okay, let me get those covers dusted.

CAPCOM Good (garble).

APOLLO 17 MISSION COMMENTARY 12/11/72 GET 119:06 CST 2000 MC 459/3

CERNAN Well, that's one consolation. It's not as
hard to get at the covers as one might think.
PAO We've got a black and white picture now.
SCHMITT I'm working on the link connection now, Bob.
CAPCOM Okay, I copy that, Jack. I copy that, Jack.
Understand you -
SCHMITT Say, it's hard to hit that garbage pile.
CAPCOM Understand - Roger, understand you almost
have the heat flow connector connected by now?
SCHMITT Yessir.
CERNAN I'm a little late, Jack, until I get these
battery covers open.
SCHMITT Okay, I got the heat flow for you.
CERNAN Okay.

END OF TAPE

SCHMITT Well, the old LEAM connector doesn't connect, just like usual, or lock.

CERNAN Okay, I'm not going to touch the batteries, the covers are clean and the batteries themselves are clean, the LR - LCRU has been dusted and so has -

CERNAN Okay, so has the TV, it's locked.

CAPCOM Okay, copy that.

SCHMITT LEAM's locked on.

CERNAN (garble)

CERNAN Okay, Bob, the battery covers are in the shade.

CAPCOM Okay, copy that, Geno.

CERNAN Well, well, well, well, okay, I hope that helps. Whee, I gonna go to max for a minute here, do you buy that.

CAPCOM Okay, Geno, we copy.

CERNAN It seems hot in the Valley of Perth.

CAPCOM Okay.

CERNAN Okay, oh, man, Yeah, I'm going back to intermediate.

CAPCOM Okay, copy that.

SCHMITT Okay, Bob, I'm ready to go to work.

CAPCOM Good.

SCHMITT Okay, I'm going to push the gravimeter.

CAPCOM Roger, mark.

SCHMITT Okay, you have a mark, you're thinking and remember what I said, it's a piece of cake to take on and off.

CAPCOM Okay, copy that.

CERNAN Okay, this is north over here, huh? Okay, I'll pull a load heat flow 10 30 west, we've got the connector connected. Third heat flow 30, place on ground experiment up, okay. We'll do that, Jack. Keep your eye on cables. Oh man, all I can do is go down hill over here. Jack, you read.

SCHMITT Yeah.

CERNAN Okay.

SCHMITT I'm just trying to level.

CERNAN Are you going to move that very much?

SCHMITT No, I'm just, I'll be working with it to try to level it. That's going to be a major task.

CERNAN Okay, there's 30 feet, I'll just - I'll get this thing squared away when I carry Boyd Bolt time.

PAO Jack Schmitt working with the lunar surface gravimeter.

SCHMITT Ha, whee, that really went.

SCHMITT Man, these things are just like they are at the Cape. You feel every one of them.

CERNAN Hey, Bob, has Ron been able to see the LM?

CAPCOM Stand by, I'll find out.

SCHMITT Oh, oh.

CAPCOM Watch it, Jack.

SCHMITT First cable, first cable hooked.
CERNAN Jack, you all right.
SCHMITT Yep, I'll straighten it up in a minute.
SCHMITT Okay, the LSG is going out.
CAPCOM Okay, copy that, Jack.
SCHMITT I hope it does the things that we want
it to for us.
PAO This is the experiment.
SCHMITT Bob, I'm not doing to badly on keeping
things clean. The base at the central station and got some
stuff on it, but otherwise pretty good.
CAPCOM Okay, Jack, we appreciate your efforts
and we understand you got the LEAM connected eventually.
SCHMITT Yes, and it locked, just took some
dealings. Okay, sun's over there. Oops, I forgot my Boyd
Bolts, let's see.
CERNAN Say, I never drilled a hole where there's
not a can.
SCHMITT Boyd Bolts are off. Bob, does it bother you
that the base of the LSG is touching soil? This is pretty
soft. Bob, did you give me an answer?
CAPCOM Roger, Ron thinks he has seen it. We
haven't had a confirmation on the last orbit when you were
talking to him, but he thinks he saw it the previous orbit.
SCHMITT Hey, hey, Bob, can the LSG, the base
of the LSG, be touching the soil.
CAPCOM Stand by on that. Roger, Jack, the -
SCHMITT Well, it's very soft and it's going to
be very hard to level for it.
CAPCOM Roger, Jack, the base can be touching
the ground.
SCHMITT Okay, it's level. Alined, the sun
shield is shaded inside. The level bubble is just touching
the outer circle, a one circle, and I'm through with that,
it's perfectly centered now and I'm going to uncage. Whoops,
the experiment moved. It's still pretty good level. Okay,
it's uncaged, the gimbal is swinging.
CAPCOM Okay, copy that.
SCHMITT The gimbal is swinging.
CAPCOM Copy that, and Jack, you're still -
SCHMITT Bubble is back just touch - yeah, I
know, I've been working man.
CAPCOM Okay.
SCHMITT Okay, I went to pseudo intermediate
between minimum and intermediate. The bubble is just
touching the - it's circle and the alignment, center
alignment is good.
CAPCOM Roger, copy that. Thank you.
SCHMITT Okay, Gene, you've got some good
slack here, if you can leave it that way. You shouldn't
have the cables draped across anything, that's good.
CERNAN Okay, I want to try and get this thing
in there. It won't there it is.

END OF TAPE

SCHMITT Can I help you, Gene?
CERNAN Yeah, I got a little dust in this mirror, though. I'm not sure I - Bob, I got a little dust on the white surface, not on the mirror of the heat flow. Have you got any recommendations?
CAPCOM Stand by on that Jack - or Gene. Is that on on the heat reflector?
CERNAN Yeah. Yeah, it's on the north side.
CAPCOM Okay, as long as not on the mirror it's okay, Gene.
CERNAN Well, let me take another look. I'll doublecheck.
SCHMITT Watch it, you're pulling pretty hard.
CERNAN Yeah, I'm watching -
SCHMITT You're pulling -
CERNAN I'm watching, I'm not pulling. Okay, the mirror's clean.
CAPCOM Okay, then it's good enough.
SCHMITT Give me some more slack up here, you're (garble).
CERNAN Like that, Jack?
SCHMITT Okay.
CERNAN Okay, that's where it's going, Jack, right there.
SCHMITT Okay, okay.
CERNAN How's that?
SCHMITT That's good.
CERNAN Got enough?
SCHMITT This way just a little, Gene-o. That's good. Doesn't take much.
CERNAN Man, we sure didn't need blocks or anything out here. There's enough soil here to level almost anything.
SCHMITT But that's so soft, though, it's hard to get a fast level. Whoops. That's strange. I think I did something wrong.
CERNAN What's that?
SCHMITT Pulled the pin at the wrong time - (garble)
CERNAN Okay, the heat flow is level, the gnomon is good, and Bob, I verified that that dirt is not on the mirror. It's on the white stuff that - that, you know, is horizontal to the surface of the box.
CAPCOM Okay, copy that, Gene, that's okay.
CERNAN The mirror - mirror's (garble)
CAPCOM Roger, thank you.
CERNAN Okay. Okay, I'll give you a TGE reading.
CAPCOM Roger, we're ready.
CERNAN Okay, 670002601 - 670002601.
CAPCOM Okay, we copy that.
CERNAN Bob, was that with the camera on it?

CAPCOM Roger, the camera's been running all this time.

CERNAN Ah, that's beautiful. Okay, your temperature will go down to a hundred and maybe a scooch under 120, so maybe those batteries are cooling off.

CAPCOM Okay, good.

CERNAN It's sure good. I don't want to walk on that 3rd EVA.

CAPCOM Roger.

CERNAN I'm getting to like driving this machine. Okay, pull pin two. Pin two always comes after pull pin one.

SCHMITT I think that's in the NASA documents now.

CERNAN What's that?

SCHMITT Pin two comes before pin one.

CERNAN Okay.

SCHMITT Drill three comes before drill one and two, also. I think I overdid that one.

CAPCOM Yeah, it went clean out of sight but by all means, watch drill two.

CERNAN Ha, ha, ha, hah, oh, you think you're so clever. Boy, you think you're so clever. Believe it or not, Bob, I'm anchoring the geophone module.

CAPCOM Okay, Jack, it looks to us on the TV as though you're anchoring the geophone module with a flag.

SCHMITT Yeah, that's what I'm doing. I'm anchoring the geophone module with a flag. Okay, one leg. Two legs. Three legs. And none of them - none of them -

CERNAN Hey Bob, remind me to police the garbage pile.

CAPCOM Alright.

CERNAN The garbage pile is turning to be - just like every other ALSEP deployment - it's hard to control.

CAPCOM And I understand all your legs came out okay, Gene-o, or didn't come out.

CERNAN Yessir, they all came out okay. Okay, LMS ring is pulled.

CAPCOM Copy that.

SCHMITT Amazing. Amazing.

PAO Jack Schmitt working with the lunar surface profiling experiment.

SCHMITT Okay, Bob, I've got my tools of the trade right here. I'm ready to go to work. Now, I put a mark in the deck - here it is, right there.

CERNAN Hey, Bob, what have I forgotten? The package won't rotate.

CAPCOM Try rotating the UHT.

CERNAN No, I'm serious. Oh, rotate the UHT, yeah.

SCHMITT Yeah, remember that one?

CERNAN No, that's right. I'm sorry. I knew it. I knew it would happen. Where's your garbage pile, Jack?

SCHMITT Well, I can't find yours.

CERNAN Well, don't worry about my garbage pile.

CERNAN It turns out it looks very much like the
ALSEP.
SCHMITT Okay, I made a mark over here that says that
should be about cable length.
CERNAN What am I doing over here. You're awfully -
you're awfully close.
CERNAN No, my, my, I'm going right in here, Jack.
Right here.
SCHMITT Okay.
CERNAN I can move it further - further north.
SCHMITT No, that's alright. No, this will be al-
right. I just want to keep away from you there. We shall soon
see how tuned we are. I'm anxious to see under this mantle.
CAPCOM So are we.
SCHMITT Well, Bob, I hope I drill you a couple of
good holes.
CAPCOM How about three?
SCHMITT And I know you do, too.
SCHMITT Okay, Bob, the arrow is east/west, pointing
west, the bubble is in the center. If I'm lucky, it'll stay
there. I'm not - I'm more like east/northeast. I'm trying to
keep a little further away from Gene.
CAPCOM Okay, copy that.
SCHMITT Breakseal is open - okay, that was my mark.
Let me see. Doublecheck that cable length. I'd sure hate to
drill a hole that was outside the length of the cable. Okay,
the LMS is deployed, I'm policing the site. The screen is over
the port -
CAPCOM I'll copy that.
SCHMITT I'm gonna move one big rock -

END OF TAPE

CERNAN What am I doing down in here?
SCHMITT What were you doing down in there? (Laughter)
CERNAN Okay. Bob, there's a little bit of dust adhering to the sides of the LMS. And a few particles less than half a percent of the surface on the top, but of course you're going to clean that one off, so that's all right.
CAPCOM That's affirmative.
CERNAN The - the north side has about a 10 or 15 per cent dust cover.
CAPCOM Copy that. And Geno, you're leaning pretty heavy forward on that drill.
CERNAN Okay, Bob. She went in - she's going in like she hit a pretty dead stop and then I hit some rocks here. I'll watch it - I won't lean forward. I'm not putting too much pressure on it.
CAPCOM Okay.
CERNAN It sounds to me like she's chipping away through rock. Maybe just a little longer drilling hole than it was at the Cape.
PAO Cernan drilling two 8 foot holes for the heatflow experiment.
CERNAN Bob, she's going in but not without a little bit of resistance.
CAPCOM Roger. We're observing that, Geno.
CERNAN Every once in a while - every once in a while she breaks through a soft spot.
CAPCOM Good.
SCHMITT Bob, I'll tell you this central station's a bear - bear to get level. Yeah, I just got dust on it now. It's just too soft.
CERNAN Boy, I sure was drilling in hard stuff cause it took a lot to get it off.
CAPCOM Okay, Jack, and we could certainly stand a little bit of dust at least on top of that central station sunshield.
SCHMITT Yeah, I guess the level's important.
CAPCOM Roger.
SCHMITT I can just see what John's thinking right now. That's what makes the difference. That's where you expend your energy.
SCHMITT Bob, I don't know that I'm going to be able to do that without a lot of time. It's hanging against the south edge.
CAPCOM Say again there, Jack.
SCHMITT I don't know whether I'm going to be able to level it - the central station.
CERNAN Anything I can do, Jack?

SCHMITT Okay, I got it off the edge.
CAPCOM Okay, then we better just leave it there.
SCHMITT Ah. Well, I'm making it worse by getting dust
on the top.
CAPCOM No, the dust on the top is not as important
as getting it leveled, Jack, but if you get it broken off the
edge that ought to be good enough.
CERNAN Bob, I'm riding at about 382. I've got - oh
I guess about 80 - well now there's half. I guess 60 percent no
flag and no tongs.
CAPCOM Okay, copy that, Geno.
CERNAN Okay, Bob, it's touching the second ring,
the gnomon is alined and I'm going to leave it alone.
CAPCOM Roger on that.
SCHMITT Yeah, I think I lost all the time I might
have made up.
CERNAN Hey, Bob, it's obvious that I'm going through
some pretty stuff - pretty tough stuff. Consolidated material,
like rock fragments and then it breaks through and then it jumps
for about 3 or 4 inches and then I hit some more fragments.
CAPCOM Roger, we're seeing that Geno. Looks inter-
esting.
SCHMITT Oh, me. I got too low on that one. I thought
I had that gaged.
CERNAN If it weren't for that geophone, you'd go
out of sight.
CERNAN Bob, there would be absolutely no way of
breaking this drill from that - those boards without that tool.
I guarantee you that.
CAPCOM Okay, we copy that, Geno.
CERNAN I think I found a way to get this off though.
With a little help. Okay, number 3 coming up.
CAPCOM Roger, the third and last one on this hole.
CERNAN Yes sir. Oh boy. Time out.
CAPCOM Okay.
SCHMITT Don't work too hard.
CAPCOM Roger.
CERNAN My fender's still on, which makes me happy.

END OF TAPE

CERNAN I'll tell you, they could come and sprinkle the whole area with water and get rid of some of this dust -

CAPCOM Okay, Geno. Can you remember that those heat flow cables are not crossed as they come out of their box?

CERNAN Yes sir. I very definitely made a point of them - not crossing them.

CAPCOM Okay, very good.

CERNAN They are not crossed.

CAPCOM Good.

SCHMITT Oh, ho, ho, ho. Where do we find such men?

CERNAN How's it coming, Jack?

SCHMITT Oh, slow. This leveling is really throwing me behind the power curve, but I know they're serious about it, so - if I can keep it like it is now I am in like Flynn. Its perfectly centered. Even the gnomon is aligned within a shadow width.

CERNAN Man, is that thing biting.

SCHMITT Really working down there, are you?

CERNAN Oh, you betcha. Man, I'm in something tough down there now. Whew. -

SCHMITT What bore are you in?

CERNAN Number 3. If I let go of that drill it would and it kept running - if that drill kept running and I wasn't anchored to the ground it would throw me over the massif (chuckle). In tangential turns.

CAPCOM Okay -

CERNAN It must be in the Mother Load, down there.

CAPCOM Gene, if its getting really tough and you're not making much progress we'll be happy with it where it is.

CERNAN No sir, you're going to be happy with it where its suppose to be and that's where -

CAPCOM You were hiding it from us, we couldn't tell how deep in you were.

CERNAN I wanted to surprise you. They're going in all the way and they're both going to work.

CERNAN Its a little tough looking into the sun.

SCHMITT Yeah.

CERNAN Oh, maneschevitz.. I don't know where I picked that word up but (chuckle) its better than some. - I guess. Now, if I can use my little lean-to here. Aw, man, that works great. That works great. Put this out of the way. Bob, I'm into the white mark, it depends on what you want to call the surface - you know its - I can give you - give or take 6 or 8 inches.

CAPCOM Yeah, something like that will do, Gene, I guess. You can measure it -

SCHMITT Gene, is the dust coming up changing color on you at all?

CERNAN No, Jack. It isn't changing color. I can't even tell where its coming up.

SCHMITT Oh, ho ho.

CERNAN I don't think it is coming up - I think I'm just pushing it aside.

SCHMITT Boy, I'm telling you'll like that central station.

CAPCOM I saw something come up just then, Jack.

CERNAN That deploys itself, it turns out.

CAPCOM Roger, on that -

CERNAN Bob -

CAPCOM Pretty amazing.

SCHMITT Okay, when I - I finally leveled it in a bull's eye. I don't know whether you heard me or not but it was - it was perfect. So its okay. Its just got a fair - its got about 20 percent dust cover on the top of it.

CAPCOM Okay.

CERNAN Glad you've got that probe covered.

CAPCOM Say, Jack, ALSEP says that that's okay - that's no problem.

SCHMITT Okay. I put a rock under the northwest corner. Oops - guess what happened? Just like in training, Geno.

CERNAN What happened?

SCHMITT The old geophone cable caught on the corner.

CERNAN Okay, Oops, I'm not ready. That says F4B on that, that's an airplane.

SCHMITT Houston, there's no dust on the probe except that which was on my hands.

CAPCOM Okay, copy that.

CERNAN That must be solar wind. - Sorry not to be more talkative but this is taking all the concentration I've got. I'll have to push this down, I can see that. Yeah, this (garbled) doesn't hold any better here than it did in training.

CERNAN Oh, don't lose that Geno - don't lose that - don't lose that. Notice how you talk to yourself out here?

SCHMITT Who, me? (chuckle)

CERNAN (garbled)

SCHMITT You're getting farther and farther behind.

CERNAN Well, I've had my one for today.

SCHMITT You're one what?

CERNAN I just did my "whifferdill".

SCHMITT Oh, did you fall?

CERNAN No, its funny, how for every action there's an equal opposite reaction, isn't it?

SCHMITT Hey, I've heard that before. - Okay, secure thermal curtains - thermal curtains are secured.

CAPCOM Okay, copy that.

CERNAN How far behind am I, Bob?

CAPCOM Roger. We're showing, Gene, just about 20 minutes and Jack's just about 25 - between 20 and 25 minutes for both of you.

CERNAN Okay. How are consumables?

APOLLO 17 MISSION COMMENTARY 12/11/72 2036CST 119:43 GET MC/463/3

CAPCOM
CERNAN
than that -

I'll check that.

Oh - if this thing isn't going to work better

END OF TAPE

CERNAN Bob, just like the book said it's down to PAPA 1 and it hooked.

CAPCOM How about that.

CERNAN Ah, boy the old fingers really suffer on these -

SCHMITT Take it easy.

CERNAN Okay. Now this one down to F-1. Would you believe F-1?

CAPCOM Yeah, I believe you, Gene.

CERNAN Bob, in this soil, there's nothing I can give you that's about an inch below the white spots or Bravo 1.

CAPCOM Okay, copy, Bravo 1.

CERNAN I got a - I got a better way of putting that last thermal shield on now.

PAO Jack Schmitt working on the ALSEP central station alining the antennas it looks like.

CERNAN Okay, Bob you're looking at it - coming out to the south but I don't expect it'll stay that way unless I put some dirt over the cable. How does that grab you?

CAPCOM Stand by, Gene.

CERNAN You like that thermal shield the way it is? Okay, that's coming out south. That's in good shape. I'm pleased with that.

CAPCOM Dirt's okay if you want to put it on -

SCHMITT (Garbled) I'm moving out.

CAPCOM Okay.

CERNAN Now the thermal shield is on there Bob. I got them all on there.

CAPCOM (Garbled) Did you want to put some dirt on there to hold it down, that's okay.

CERNAN Oh, okay. Well, I got it down without the dirt.

CAPCOM Okay. Good enough.

CERNAN I just found all sorts of good ways to make life easier out here.

SCHMITT Stay away from the cable.

CERNAN Bob, and I didn't forget the last measurement either.

CAPCOM Roger, that.

CERNAN Hey, can you see this big mound that I just walked - just to the north - not the mound the depression that's just to the north of me?

CAPCOM Roger, 17 (garbled).

CERNAN It's probably behind the Rover. Okay, how's that one for the core?

CAPCOM Stand by.

CAPCOM Geno, can you give us distance estimate to that? Does it look like it's 80 feet or so?

CERNAN Yeah.

CAPCOM Okay, then that sounds good.

SCHMITT Oh, shucks. Hey, Bob, is there any way a level bubble can fail? (Laughter)

CAPCOM Jack, remember that's on top of wobbly legs and wobbly springs there and would be thing not being straight. You shouldn't really expect the level bubble to be level after the things been deployed. That happened at the Cape a couple of times remember?

SCHMITT Yeah, but Bob I've - I've moved this practically all the way down the full throw and it's - that bubble won't move and I can't get it to move by tilting it and I was level. And the bubble on the top of the central station is still level.

CAPCOM Okay, you're talking about the level on your other one, huh? Stand by on that.

SCHMITT It's over (garbled). Both of them - I can't get it to move to the other side of the fluid.

SCHMITT Keep working. That thing shouldn't fail. I've gone full throw that's not level. That bubble's stuck in there, somehow. In both of them. That's not even pointing close to the Earth. Okay, I'm going to have to tweak it up and let them see the signal strength tweak it.

CAPCOM Okay, why don't you try and manually point it try and level it and see what you can do toward getting it towards the Earth.

SCHMITT I will, Bob. That bubble's just not working. I can't figure that one out.

CAPCOM Okay, just go ahead and -

SCHMITT Okay, maybe I jarred it loose here.

CAPCOM Okay.

SCHMITT Okay, I think I jarred it loose.

CAPCOM That's another first. Okay. We won't.

SCHMITT Okay, I got another one loose. That's very strange. A sticky level bubble. Ha Ha. Never heard of it. Hey, Bob.

CAPCOM Go ahead, Jack.

CERNAN If you're looking at me, what I'm talking about is this depression - is this depression in here for the core, oh, maybe 15 or 20 meters out here, Jack, what did you have in mind for the neutron flux?

SCHMITT Either the one you're in - you're down in there, or the next one over behind that rock in front of you over there.

CERNAN Only I can go way over there. That's not too far probably.

SCHMITT Either way I think is fine, Gene. But I would suggest behind the rock for a neutron flux, (garbled) and the core.

CERNAN Well, I wanted - I thought you wanted to core in that depression.

SCHMITT Well, that - there's also one over there.

CAPCOM Okay, and 17.
CERNAN Okay, I'll go behind that rock.
CAPCOM 17, 17 we think you guys are by far the best
position to judge that, far better than we are. You know what
the requirements are on shielding and greater than 50 meters -
25 meters.
CERNAN Okay, Bob.
CERNAN Okay, Bob. Okay, the long bores in.
CAPCOM Okay, copy that, Gene. Looks like that one
went in fairly well.
CERNAN Well, probably about like the other one did.
Not too bad.
CAPCOM Okay.
SCHMITT Oh, I must be getting old.
CERNAN I expect the next two are going to be a little
harder.
SCHMITT Bob, I'm not very happy with this level., but
I'll turn it on - after we come back a little bit later, when they've
warmed up some more and let's see what it looks like.
CAPCOM Okay, we'll do that. Give me a mark when you
turn it on and we'll see what kind of signals we get.
SCHMITT Okay, the shadow gnomon is aligned and we're
turning the shorting plug on.
CAPCOM Copy that.
SCHMITT It's on.
CAPCOM Roger.
SCHMITT And -

END OF TAPE

CERNAN And the needle is fullscale left.
CAPCOM Okay, copy that.
CERNAN I can't believe that.
SCHMITT What's your problem?
CERNAN Well, that whole bore turns in the ground,
it's so loose. You know those threads sometimes stick on you a
little bit. I got one stuck halfway down and the bore is turn-
ing so now I've got to use a wrench on it.
CAPCOM Okay, Jack, and we have two -
SCHMITT Bob, I've got a rock about ten feet south-
east of my LEAMS location. I could move - I could move a little
more north and get a look at 15 feet from that. That okay?
CAPCOM How big is the rock there, Jack?
SCHMITT Oh, it stands - it's a meter wide and stands
about a third of a meter high.
CAPCOM About a third and about a foot high.
CERNAN Bob, how's that for -
SCHMITT A third of a meter.
CAPCOM Okay.
CERNAN Bob, how's that for soil mechanics? I pulled
the first bore right on up trying to get this thing on right.
CAPCOM Now put it in - put it in before the hole
fills up there, Gene-o.
CERNAN Yeah. Right now I'm interested in getting
this second bore on. Now, let's see if I can get it back in.
Well, not quite as far, but high enough for me to reach the -
it still feels - Bob, like there's a lot of fragmental material
down there.
CAPCOM I'll copy that, Gene. Good luck.
CERNAN That was an interesting little exercise. Well,
I got the bore on right, anyway.
SCHMITT Well, shoot.
CAPCOM Okay, Jack, as long as it's only 1 foot high
and 10 feet away, that will be satisfactory.
SCHMITT Okay. Okay, Bob, the lead's deployed, the
line and the level bubble is just touching the inner ring.
CAPCOM Copy that.
CERNAN Hey, Bob, did you get anything from the ALSEP
yet?
CAPCOM Watch that cable, Jack. Roger. Started to
tell you that when you had the question there. We're getting a
good lockup on the data.
CERNAN Well, keep an eye on it because I'm not
happy with the level.
CAPCOM Okay, we'll get back with you on that.
CERNAN I'll check. It may be checking.
PAO The LEAM is the Luna Ejecta and Meteorite
Experiment.
CERNAN I found a way to get over cables. Ah,
Manischewitz - whew.

SCHMITT There you go again.
CERNAN I know. Let me get this one off and take
a bite of candy here.
SCHMITT I've sure been having trouble with UHTs
today. They just don't want to lock in when you get dust in
them.
CERNAN Hey, Jack, be careful with the UHT on
heatflow because it was alined - real good.
SCHMITT It was what?
CERNAN The heatflow experiment electronics when
you go over it with the UHT was alined.
SCHMITT Yeah.
CERNAN Bob, I'm ready to take a zap of cold water.
CAPCOM Okay, sounds good to me.
CERNAN Whee. Well, it looks like it's getting
dark out, is it? Guess not.
SCHMITT Hope not or we is in trouble.
SCHMITT I think maybe I went the wrong way. I did.
I went to min instead of max. Here it comes. Oh, boy. Oh, boy.
Man, what did?
CERNAN Okay, Jack, you're alright - good deploy.
SCHMITT Huh.
CERNAN Good deploy. Nothing, you're alright.
SCHMITT Coming out a little hard. Wouldn't you
know it?
CERNAN Okay, I'm backing in, Bob.
CAPCOM Okay, copy that.
CERNAN By any change, have any heatflow data yet?
CAPCOM No, Gene-o, we don't have the heatflow
turned on yet.
CERNAN Right. Oh, that's right.
SCHMITT I think that's right.
CERNAN Okay, I'm about to give you your number. Oh,
Goddarnit. Crank it a couple of times.
CERNAN Clean as a whistle.
SCHMITT Well, just like I thought. Antenna doesn't
want to go in.

END OF TAPE

CAPCOM Is that the number 3 section there, Gene?
 CERNAN Yes sir, Bob.
 CAPCOM Roger, beautiful.
 CERNAN Well, it's the last one I've got. I
 guess we'll find out when I put the probe in. I think
 they're all in there.
 SCHMITT Okay, I'm about ready to deploy some
 geophones.
 CAPCOM Okay, Jack, did you get the antenna
 into that sub pallet okay, eventually?
 SCHMITT Yes.
 CAPCOM Good enough.
 CERNAN Bob, I occasionally hit stuff and it -
 it spits the whole drill back at me. Knock it back about
 a half inch or so and then it will bite through it.
 CAPCOM Okay.
 CERNAN My general impression is that there is
 an awful lot of fragments I'm busting up down there.
 CAPCOM Okay.
 CERNAN Okay, Bob, that last 6 inches I really
 came into something hard, but it's down all the way.
 CAPCOM Beautiful, Geno.
 SCHMITT Oops, there's a heat flow probe.
 CERNAN What happened?
 SCHMITT I - I messed up -
 CERNAN Man, don't hit that, give me heart
 failure after all that drilling.
 SCHMITT No, I just walked to close to it, I
 apologize for that.
 CERNAN I don't care how close you walk to it -
 SCHMITT I'll mark that.
 CERNAN Just don't step on it.
 SCHMITT I'll do that, (garble)
 CERNAN Hey, Bob, just out of curiosity, what
 kind of heart rate has this drill been producing on me?
 CAPCOM Stand by. Okay, you've been running at
 120 flush speed with peaks of 140 to 150 from time to time.
 CERNAN Okay.
 CAPCOM And there goes the last heat flow hole
 on the Moon.
 CERNAN Ooh. Yes sir, I tell you, if you learn
 how to use your instruments in this 1/6G, you take your time
 and you get around it's a freak phenomenal, but you try
 and bend over with out some help, not so phenomenal. Boy,
 what a ride that Challenger gave us coming down. What a
 ride.
 SCHMITT Oh, you dummy - you dummy.
 CERNAN Jack, you still with me?
 SCHMITT Yeah.
 CERNAN Okay. Boy, I'm getting dropsies now.
 Getting dropsies.

SCHMITT Don't push it.
CERNAN Getting dropsies.
SCHMITT Take a rest.
CERNAN Unbelieveable - unbelieveable.
PAO Gene Cernan putting the second heat
flow probe into place.
CAPCOM Okay, Geno, and the heat flow is on
and looking good.
CERNAN That's good news, Bob, let me give
you another one here. While it's duty I'll tell you I'm
in to the bottom of the white mark and that's - oh, about
bravo 1 again.
CAPCOM Okay, I copy, Papa 1, Foxtrot 1 and
Bravo 1.
CERNAN No sir, Bob, no the support stem is in
to the top of the white mark, I'm still putting the probe
down.
CAPCOM Okay, copy that.
CERNAN And the top of the white mark is about
bravo 1.
CAPCOM Copy that.
CERNAN About bravo 1. Okay, here goes the
probe. Pick a number you'd like to hear. How about papa 1.
CAPCOM How about papa 1, Geno.
CERNAN Bingo, Babe, you win and it locked in.
CAPCOM Rog, I think Mark won that one.
CERNAN Papa 1.
CAPCOM Roger. And, Jack, I gather you are
probably tramping across the landscape with a geophone
about now, right?
SCHMITT That's afirm.
CAPCOM Okay, and let me ask you -
SCHMITT Good gravy, you know this rock -
CAPCOM Stand by. Go ahead.
SCHMITT Go ahead, Bob.
CAPCOM Okay, I gather - you said that the
HFE ELEC was leveled and alined and I gather that
meant it was on the black decal on top, do you happen to
remember what a number was on that?
SCHMITT Well, I'll check it, but I don't think
you know where that decal is.
CAPCOM Well, okay. Good enough.
CERNAN Okay, Bob, the little thermal seal with
the F 1.
CAPCOM Hey, that's another bingo.
CERNAN And I'm coming out to the south. I'm
coming out to the south.
CAPCOM Roger.

END OF TAPE

CERNAN And the thermal shield is in place.
CAPCOM Roger, copy that.
CERNAN Well, it was until I moved it. Do I need
my javelin any more?
SCHMITT You might.
CAPCOM One never knows, Geno.
CERNAN I think I'll save it until after - I think
I'll save it until after I drill the core. Oh, me or my ...
SCHMITT Take it easy, Geno. You sound like you're -
CERNAN No, I'm doing fine.
SCHMITT Okay.
CERNAN That sun is just bright - I ought to put
those visors down, I suppose - those other visors. Okay, let
me take a look at my list and see whether I've got everything.
Measured measured high tide - you've got all those shields,
you're coming out south - verify heat flow is level and aligned -
it is aligned and gnomon was good, UHT to the LRV LMPC and
then what do I do - let me see. deep core prep - Jack, I'm going
to leave the UHT and get me the heat flow in case you need it.
SCHMITT Okay.
CERNAN Okay. I'm going to go behind a rock over
there -
SCHMITT Now, now.
CERNAN In that depression, Bob you do want the
core in a depression, right?
CAPCOM Roger. That's affirmative, Geno.
CERNAN Okay, nobody touch my heat flow. That's
the prettiest job I've ever done. Okay, I'm going behind a
boulder over here. - Bob, I've got about 385 and, I guess,
about 50 percent - I can't see it too well.
CAPCOM I copy that, Geno.
CERNAN And no flags, and no tone and I'm
on intermediate cooling and I feel great.
SCHMITT Likewise, and I -
CAPCOM Roger.
SCHMITT and LMP is - LMP is 56 percent.
CAPCOM Roger, copy that.
SCHMITT What are you, Geno?
CERNAN Well, I can't see it. The sun is - I don't
know Jack, oh about 5 - yeah, about 55 or 54.
SCHMITT Okay.
CERNAN Now, this ought to shield that thing from
the doggoned - a -
SCHMITT Pressures 385 on the LMP.
SCHMITT (garbled) getting these geophones within
2 degrees of vertical in this undulating terrain (chuckle) I
think they're pretty good but its not real easy to tell what
vertical is.
CAPCOM Roger, Jack.
CERNAN Now this is right in line with the general
depression and its right in line with the RTG with the rock
in the middle.

CAPCOM Okay, Geno. As long as you're drilling behind the rocks from the RTG, that's great.

CERNAN That's where you're going to get it. Let me see what I need. Drill vac core vac - Drill at 1 IPS. Okay, let's go do it right.

PAO Gene Cernan preparing to drill another hole - these cores will be brought back to Earth and the neutron flux experiment will be placed in that hole.

CERNAN I'm up here right in this depression. Right in it.

SCHMITT There, get in the middle of that.

CERNAN It's a shadow - where - if I go over there I'm not shielded, Jack.

SCHMITT No, that's good. Get it in right here. Get it in that place.

CERNAN Right in this little - It's only about a 4 meter depression.

SCHMITT Oh, wait a minute - oh you're on the other side of the rock. Okay.

CERNAN Yeah, yeah, I want to get back here.

SCHMITT That's good. Oh, man, go slow.

PAO We're at 3 hours 21 minutes into this EVA.

SCHMITT Bob, all of these big boulders around here that I've looked at are the same rock type. Oh - who pulled all the geophone module.

CERNAN Can't imagine.

SCHMITT Okay, that sounds like the title of a book.

CERNAN Oh, oh. There it went.

SCHMITT What happened?

CERNAN I lost my vice. I see it. I see it. I took number one in the right direction. Yep. Okay, number 4 will be a little hard to pick up.

SCHMITT All these little craters are filled with glass.

CERNAN Come back here. I've got to chase this thing over the lunar surface.

SCHMITT I've seen glass covers.

CERNAN Oh, I'll dig about there, I guess.

SCHMITT As I was saying, Bob, all these big blocks that I've looked at look like the ditroite rock that I was talking about - possibly upwards of 50 percent plagioclase rather than 30 like the Mare an intermediate gabbro of some kind - and one big block there has very sharply defined parallel parting planes. I think there is a foliation of minerals that parallel that parting but I'll have to check it out.

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CAPCOM Okay, copy that Jack.

SCHMITT Those parting planes go over the - go through the whole boulder on the order of at least 3 meters long and out-crop.

PAO Jack Schmitt deploying the geophones of the lunar surface profiling experiment in a large T shape.

SCHMITT How is it going, Gene?

CERNAN Fine. I'm on my second stem, here - or I'm starting on it. How are you coming?

SCHMITT Okay, I'm just about ready to pick up a biggy geophone 4.

CERNAN Have a good time.

CAPCOM Okay, and Geno, how are you doing? We've been watching Jack traipse back and forth across the (garbled)

END OF TAPE

SCHMITT I'm getting there, Bob. I'm trying to fit a -
CERNAN Talk about seven league boots.
SCHMITT Put stem number 2 on .
CAPCOM And Jack, how's the visibility back to the
center geophone?
SCHMITT Not bad.
CAPCOM Okay, you're not having to worry about the
photos yet.
SCHMITT No, I've been checking it. Bob, my biggest
problem is that the plies don't anchor.
CAPCOM Okay, copy that.
SCHMITT In general, the lines are following the
contours. Whoops - whoops -
CERNAN Now, I'll try another one. Oh, God -
CAPCOM What's the problem, Gene-o? It won't screw
on?
CERNAN Oh, yeah. It's just no problem. You know
it's the same problem you always have. You get these threads -
get a little side force on them and - you know, with a helmet
and gloves and what have you - sometimes they go on easy and
sometimes they don't.
CAPCOM Copy that.
CERNAN Okay, I got this one on now.
CAPCOM Roger.
SCHMITT Boy, do I have a ball of spaghetti here,
but the geophones are going in the right direction. I hope you
don't have an EMI problem. Can the geophone lines cross, Bob?
CAPCOM Stand by on that. Okay, no problem, Jack.
SCHMITT Okay. Hey, if you see me start to pull over
that module there.
CERNAN Hey, don't do that.
SCHMITT No, I mean - no that won't hurt. It's just
that it stretches the other geophones tight.
CAPCOM Okay. Alright, now we're watching Gene.
SCHMITT Okay, don't worry about it. I'll watch it.
The anchors are completely unsuccessful on the module, anyway.
CAPCOM That looks pretty good, Gene-o.
CERNAN Not too bad, Bob. The first core was awful
loose. I think I could have pulled it back out with my hands.
CAPCOM That was not the idea.
SCHMITT Oh, boy, oh boy.
CERNAN Speaking of boy, oh, boy, are you a long
way off.

END OF TAPE

CERNAN Okay, gonna stop for a second, Bob.
CAPCOM Okay, we've observed your problem with getting the wrench off, Gene-o.
CERNAN Well, I had to get down and get that - to get that third - third stem line and get it on there. This is the easy part but I just got myself behind a (garble) here for a second.
CAPCOM Alright.
SCHMITT How's the time, Bob.
CAPCOM Okay, presuming you're taking photos now on geophone 4 - (garble) finish geophone 4, Jack, you're about - by now we're putting it about 15 minutes behind.
SCHMITT Okay.
CAPCOM And no problem on the timeline so far.
(Garble)
CERNAN Phew, you know Bob, one of the problems is I'm working in a small crater and it's just a little difficult to work on these slopes. Okay, I'm done. Ready to put the drill in.
CAPCOM Okay, Gene.
CERNAN Okay, get the dust out of the bit by blurb- ing it. Oh, man, okay. How am I doing, Bob, on the time? Jack, do you read me?
SCHMITT Yes.
CERNAN Because, I don't see you.
SCHMITT Yeah, I'm out by the big rock.
CERNAN Oh, okay, I gotcha. Man, I hope that hole doesn't collapse. I'm going to be awful disappointed. I think I could drive that heatflow flux through or neutron flux, at least for one probe, without any problem. Okay, Bob, if all goes well in the next few short moments, you'll have the final unleaded corestem automatic in this area on Apollo 17.
CAPCOM On a Monday evening, Roger.
CERNAN Yeah, on a Monday evening. That is what it is, isn't it? Hey, who's winning the football game?
CAPCOM Stand by, we'll find out.
CAPCOM Okay, and Jack and Gene, the score is 10 to 10 at the half.
CERNAN Yeah, that's Oakland and who?
CAPCOM Jets.
CERNAN (garble)
PAO The duration of this EVA will be 6 hours and 45 minutes. The oxygen supply in the backpacks is being used at a slightly higher rate than anticipated. We are 3 hours and 40 minutes into the EVA now.

END OF TAPE

CERNAN Hey, Bob, will you settle for about 8 inches
out of the ground? It's about as low as I can get.
CAPCOM Okay.
CERNAN I haven't heard from them recently.
CAPCOM Okay, Geno. We'll give you a minus for that.
But it's still an A.
CERNAN Well, I'd go lower if I could get an A plus.
But I'm going to accept an A minus 'cause I'll never get the wrench
on it if I go any lower.
CAPCOM Roger, there Gene.
CERNAN I'm within an inch of the white stripes,
how's that?
CAPCOM That sounds great to me.
CERNAN An inch of the white stripes, Bob.
CAPCOM Roger, and they're worried up here that you
didn't clear the flutes, Geno, you want to tell them that, so
they'll be happy.
CERNAN Yes sir. I'll tell them I did clear the
flutes.
CAPCOM Okay. And Jack, where are you lost on the
plains?
CERNAN If you want me to do it some more, I will.
CAPCOM No, if you cleared it, that's sufficient. And
Jack, where are you on the plains of Taurus-Littrow, there?
SCHMITT I'm over here.
CERNAN He's a 180 from where your camera's - from
where I am.
CAPCOM Okay.
SCHMITT Right across the Rover.
CAPCOM Okay, are you getting ready to take geophone
photos or ALSEP photos?
SCHMITT Getting ready to enable the old geophone.
CAPCOM Okay, I think that that means you've taken
the geophone photos.
SCHMITT Oh yes sir, and I forgot the gnomon. (Laughter)
CAPCOM (Laughter) Hey, Jack, how about giving me
a couple of quick readings here to satisfy some people. One,
was there a decal on the LEME that you aligned it with. There's
some controversy down here that there's no decal there, and the
question is, if there isn't they want a reading out of the degrees.
But we keep saying there's a LEME decal and we can't prove it.
SCHMITT I'll go prove it, Bob. I'll go by there.
Stand by.
CAPCOM Okay.
SCHMITT What's the other question?
CAPCOM And the second question is, is there a decal
and was it aligned on the (garble) the 20 degree decal on the
LSG. Was that also aligned?
SCHMITT Yes sir.
CAPCOM Okay. Copy that.

SCHMITT An orange one.
CACCOM Roger. Agree.
SCHMITT As per drawing.
CAPCOM Roger, sir.
SCHMITT As per drawing.
CAPCOM Roger, you don't have to prove it to me.
SCHMITT Yes I do.
CERNAN Okay. Okay, Bob. I was able to pull the core out.
CAPCOM Okay and Jack, how far - Okay, go ahead.
CERNAN - - with the drill. I was able to pull the core out with the drill, about 3 inches and it's all jacking material from there on.
CAPCOM Okay, Geno. Copy that. And we finally got some word from the Cape to prove to the people that the decal's on the LEME, so you don't have to go back by that, Jack.
CAPCOM Just at the right time.
SCHMITT I all ready have. It's reading 30. And here's the decal.
CAPCOM Okay, copy that.
SCHMITT Okay, I guess I'd take ALSEPs word.
CERNAN Good.
SCHMITT One more, once more I tempt the fate of the god of the cables.
CAPCOM Okay, and Jack, we're getting ready here to try and save a little bit of time and we're saying that, why don't we just take two stereo pans for the ALSEP photos. First stereo pan will be in the vicinity of the original stereo pan, and the second one they suggested will be to the northwest of that original one.
SCHMITT Northwest. Okay.
CAPCOM Yeah, and I suggest that you go far enough that you can see the LEME past the central station.
SCHMITT Yes sir.
CERNAN Hey, Bob. You'll be interested to know, I just put a - I just put a plug in the top of that core and it disappeared from sight down the center - center of the core. I'll put a cap on it too. But, I want to plug it first. I want to - I want to get the rammer to plug it down.
SCHMITT Hey, Bob, where do you want us to focus on the pan to be?
CAPCOM Stand by on that.
SCHMITT About 15 feet?
CAPCOM Stand by.
CERNAN Where's my rammer?
CERNAN There it is.
CERNAN Hey, Bob, that's strange. That plug was too small for the core.
CAPCOM Hey, Jack. Have you got a focus that's somewhat short of - well, between 74 feet and - just a little short of 74 feet.
SCHMITT I've all ready taken it at 15, Bob. I think that's pretty good.
CAPCOM Okay. We couldn't get an estimate.
SCHMITT It's not a calibrated detent, but I don't think you'd need it here.

CAPCOM Okay.
 SCHMITT How far northwest?
 CAPCOM Go ahead, 17.
 SCHMITT About the same - about the same position as
 the heat flow downsun - or upsun?
 CAPCOM Okay, stand by.
 CERNAN Okay, Bob I was able to -
 CAPCOM Yeah. That sounds pretty good to me, Jack.
 CERNAN - - to get. Bob I ran that plug 3/4 -
 2/3 of the way down the rammer and it hit solid pay-dirt.
 CAPCOM Okay, that sounds good.
 CERNAN I'll put a cap on it for you too.
 CAPCOM Okay, that'll make people happy.
 Did you copy me Jack that (garble)
 SCHMITT I knew it would. And that -
 CAPCOM Understand.
 SCHMITT Roger, Bob.
 CAPCOM And, Jack, would you confirm for the ground
 that you got the LSP enabled.
 CERNAN That's CAP ALFA.
 SCHMITT No, I didn't. You interrupted me. Good boy.
 I was on my way and the LEME interrupted me. I'll get it.
 CAPCOM Roger.
 SCHMITT Keep after me.
 PAO Gene Cernan will use a jack to get the
 core stems out of the -
 SPEAKER Bob, that's CAP ALFA that's on the - that's
 on the core.
 CAPCOM Say again there, Geno.
 CAPCOM Jack, you're taking your second pan, right.
 SCHMITT I don't see how they're hearing us all the
 time.
 SCHMITT Yeah, but the camera just stopped.
 SCHMITT Oh. Man.
 CAPCOM What was your question, Geno?
 CERNAN I just said that was CAP ALFA on the core.
 And let me tell you, it's coming, but, this thing is really in
 something. Oh.
 SCHMITT Would you believe I'm out of film, Bob?
 CAPCOM Okay, I'm afraid I'll have to.
 SCHMITT Why didn't I look at the number.
 CAPCOM You want to give me a frame count.
 SCHMITT Mag alpha is empty.
 CAPCOM Okay. Copy that.
 SCHMITT It's 158.
 CAPCOM Copy, 158.
 CAPCOM Okay, Jack, we're recommending magazine
 Hotel and we also suggest you take the second pan when you re-
 take it at 74 feet.
 SCHMITT Okay.
 CERNAN Man, it didn't feel like this stuff was
 this hard.
 SCHMITT What's the problem, Geno. You need some help?

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CERNAN Nope, nothing you can do. Just jacking
away. See if I can get this thing out of the way. See if I
can get it out, is what I'm really saying. I may be jacking the
treddle down into the surface. Change hands.

END OF TAPE

CAPCOM Okay, Jack, if you haven't put magazine
Hotel on. We want to recall that and make it Magazine (garble).
SCHMITT Well, Bob, I've already got it on.
CAPCOM Okay. Sorry about that.
SCHMITT Is that okay?
CAPCOM Leave it on.
SCHMITT I know what you want. You want color.
CAPCOM That's affirm.
CERNAN Well, here it is. It's black and white
also.
SCHMITT Scale - you mean Charlie.
PAO That jack applies about 5 to 600 pounds
of pressure.
SCHMITT Do you want color or do you want Charlie.
CAPCOM Stand by, Jack, if you're still at the
Rover.
SCHMITT Well, I'm still here, but I got Hotel
on.
CAPCOM Okay. Leave Hotel on. We goofed.
(garbled)
SCHMITT Well, okay. We don't have much time,
otherwise I'd change it. I should have thought of that
myself.
CAPCOM Well - -
SCHMITT We haven't got a lot of time cause I've
got a lot of jacking to do. Man - let me finish the pan
and I'll come and help you.
CERNAN There's not a lot you can do, Jack.
SCHMITT I'll get the neutron flux ready.
CERNAN Well, thanks a lot.
CERNAN Okay. Come on, baby. I'm going to
get this thing out now that I got it.
CAPCOM Boy, you know that's what you call getting
down into your work.
CERNAN Bob, I'll save my comments till later.
I hope this core is appreciated.
CAPCOM Roger, Gene. And I have word from the
back room that it is appreciated.
CERNAN Yeah, that makes me feel warm. I'll
get it. You're going to have to bear with me. Man, I don't
know what it did.
SCHMITT I was afraid that would happen.
All those rocks.
CERNAN Yeah, but it didn't go in that hard.
CAPCOM Hey, Geno, how about whacking off for
a minute there, you got going pretty hard.
CERNAN Okay. One more turn and I'll get up.

CERNAN I've got to hit an easy spot sooner or later.

CAPCOM It seems that way.

CERNAN You're right, Bob. I'm going to take a rest. You betcha. Man, I hate to say it, but I - I'm not 25 percent of the way there. I can feel it kicking now. I'm going cold.

CAPCOM Okay.

SCHMITT Okay, Bob. I got your pans and a couple of picture of the heat flow probe. Now, let's see -

CAPCOM Okay, Jack. If you've got the two separate pans there, we're suggesting that you - since the PDR's still working on the quarry cover, we suggest you sample the large boulders and loose material on top of some of the smaller large boulders in the vicinity. I would look through some sampling here while Geno's pumping on the old jack.

CAPCOM Unless you've got - -

SCHMITT Want me to help him?

CAPCOM Well, unless you guys - okay. Let me finish. Unless you guys think that two guys can do that better than one, I'm not sure.

SCHMITT Gene, you want me to spell you a little.

CERNAN Jack, I don't think there's a lot you can do. Come on over here one minute. Let's see if I can -

SCHMITT Well, I can use up some of my water.

CERNAN Let's see if I can't get a bigger bite with you on one end and let me stand on the treddle and we might be able to get a bigger bite. See, I can't get a very big bite. That's one of the problems.

CAPCOM And Jack, could you verify we have the LMP enable on -

SCHMITT Let's hope the jack doesn't break.

SCHMITT No, I'll get it. I knew there was something I needed to do.

CERNAN Get the jack hand over here. On this side. Let me put some weight here. See what kind of bite you can get.

SCHMITT Oh, man.

CERNAN Yeah, that's what I've been doing.

CERNAN See if you can get a bigger -

SCHMITT Oh, no. It's coming though. Let me get my foot down there and you get the jack. See that's the key. Now, I think I can -

CERNAN Okay, if I do it that way - get her way down there. Okay, now try it. If we get a couple of inches at a throw, we're all right. There you go. Do that for a little bit.

SCHMITT Okay, let me put my foot on it. Okay, ready?

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SCHMITT I can get it. Why don't you go get your -
why don't you get your pan and your -
CERNAN I've got that.
SCHMITT - LSPE and I'll - -
CERNAN I'll get that and a few samples there.
SCHMITT Okay, go ahead and do that. I can get
it.

END OF TAPE

CERNAN Whee, let me tell you Red Rover, let me tell you. I know whose face is smiling back there.

PAO Ron Evans is coming up over the crater Copernicus in his 17th revolution of the Moon. He's right on the flight plan. Everything going good. Sounder data coming in good.

CERNAN Yeah.

SCHMITT Okay, Houston. Mark it, enabled.

CAPCOM Okay, finally. Thank you.

SCHMITT Whoops, I moved your an - your central station. I've got a real eye on your antenna.

CAPCOM Stand by, Jack. Wait a minute.

SCHMITT Well, the gnomon's still aligned. I thought I moved it.

CAPCOM Okay, Let it be.

SCHMITT Yeah, we should have raised the flag on this thing. It looks just the same as when I left it, but I thought I moved it.

CAPCOM Okay, Jack.

SCHMITT Is it okay, Bob?

CAPCOM Okay, leave it alone for right now, Jack and we'll get a reading on it.

SCHMITT Okay.

CAPCOM In a minute or so. And Jack I guess right now if you might get some fairly rapid samples in the area, since you're probably almost ready to leave. And can you tell us what you saw there in the vicinity of the - you were giving us a description of the boulders there and flatness of the - and alignment of the crystals plag - You want to emphasize that a little bit?

SCHMITT Okay, then. I will as soon as I get back over there with the sample bag. Bag 10 ECCO 10 ECCO is a sample of a very large boulder that's just beyond geophone 3. Just west - just south.

CAPCOM Copy that. 10 ECCO and boulder east of which geophone?

SCHMITT South of geophone 3. Southwest. And I got a few photos to docu - - document the boulder. I'm not sure I documented the sample, though.

CAPCOM Okay, copy that.

SCHMITT It - it's a - it's the the same kind of rock - the same kind of rock I saw near the LM and the gabbro I'm beginning to lean towards 50 percent plagioclase, though.

CAPCOM Okay.

CERNAN Bob, I had to remove the treddle from the hole and I'll tell you later why.

CAPCOM Okay, go ahead.

SCHMITT Oh me. Now I'll tell you later why.

CERNAN I'm just figuring, oh me, how am I going to get all this stuff, now. If I lose my hole. Okay, it was right there. In our fiasco over here, we knocked everything over.

SCHMITT Did I ruin something?

CERNAN No, I've just got to stoop over to get things and that's a major - major effort these days.

SCHMITT Can I help you?

CERNAN Nope, I got it here. I've got a delicate core in one hand, and I'm trying to get some core caps in the other. You'd be glad to know it's full, Bob, and while I'm the only one to see the bottom end right now I'm going to tell you it - it looks like - it looks like what I'm walking on but it's obviously not powdery. It's obviously very cohesive because it - it - the bottom of the core is not smooth, it's very jaggedy, and fragmental-like.

CAPCOM Okay, copy that, Gene-o. Very good.

CERNAN Okay, I'm being very careful with your core here but I've got to do a few little housekeeping chores first.

CAPCOM Okay. Have you got that neutron flux over there in the vicinity or is it still back at the Rover?

CERNAN No sir, I've already got it.

CAPCOM Okay, good enough.

CERNAN Yeah, I've been looking.

CAPCOM And Jack, in your travels there, while you're doing some sampling, if you hap - happen to wander by in the vicinity - approximate vicinity of the double core - the deep core you might get us a rover sample of the soil there.

SCHMITT Okay.

CERNAN Bob, and the core is filled to within a - an eighth or certainly less than a quarter of an inch from the - from the bit.

CAPCOM Okay. Sounds good to me - sounds like a good candidate for CAP.

CERNAN Yes sir, and it's got Bravo on and the plug has been discarded.

CAPCOM Copy that.

CERNAN Now, let me see what else I can get here before I get too upset. I need my - my - the drill besides performing admirably. Is a tool of necessity to lean over and pick things up with. Except when you let it fall down.

CAPCOM Okay.

CAPCOM And our next priority is to put the neutron flux down the hole, we hope.

CERNAN Well, we shall see. Man, I don't even know if I can find the hole. It's in the shadow now. I guess I can see it down there. There it is. Okay. You asked, and with a little bit of luck, you shall receive. Listen, I'm earning my three and a quarter a day today. Oh boy, I don't want to lose the rammer either. Let me get that before that gets lost in the shuffle. We don't want to lose that for sure. I bet you all think I'm stepping on that hole, don't you?

CAPCOM I don't. John doesn't either.

SCHMITT Bob, I see no - no clear alignment of plagioclase pyroxene in this rock. That's the one with the parting in it. It looks as if - integrating what I've seen here and over at the big rock, the geophone rock, I - that the layering or the foliation or the parting, whichever it is, is the result of variations in vesicle concentrations. The sample 10 ECCO is a sample of the more coarsely vesicular rock. I could not get one of the finer - part - more finely or non-vesicular fragments. But I got pictures of it.

CAPCOM Okay, copy that and do you see any of the (interruption) -

SCHMITT I'm having trouble -

CAPCOM Good.

SCHMITT Go ahead.

CAPCOM Can you see any of it in the soil on top of some of these medium sized boulders?

SCHMITT There's soil. A little bit of dust in some of the holes. But I - there's not enough to sample at this point. I may find some later.

CAPCOM Okay, copy that. He's picking up the old -

SCHMITT Vesicle walls do not seem to be as shiny. Most of them seem to have dust in them.

CAPCOM Copy that.

SCHMITT The vesicles are not cleanly spherical - they're spherical but they have fairly rough outlines. They look as if there's been some re-crystallization.

CAPCOM All right.

CERNAN Bob, I will verify that the lower section is on.

CAPCOM Okay, thank you, Gene-o.

END OF TAPE

SCHMITT I picked the wrong rock to sample with a scoop, I'll tell you that.

CERNAN Boy, I'll tell you, housekeeping is the key to the world right now.

CAPCOM Okay, Gene-o and - let's

SCHMITT Another key to the world is one of -

CAPCOM Gene-o, stand by, hold it.

CERNAN Yeah.

CAPCOM Okay, make sure that top of it doesn't go down through the hoe too, and disappear, like putting it through the treadle, or if you're sure that the - or whatever.

CERNAN Boy, Bob, that sure is a good thought. You know I had to take the treadle off - the jack wouldn't go down and no way I could put that treadle - well, let me turn it on first. That was a good thought. It may, it may go down in that hole. That would be terrible.

CAPCOM How big's the hole look, Gene-o.

CERNAN See, the jack wouldn't - well, looks big enough to put this down. Let me - let me use my judgement on it, and a little ingenuity.

CERNAN I verified the top was on, by the way.

CAPCOM Okay, thank you.

CERNAN Chazam.

CAPCOM How about that, loud applause, loud applause.

CERNAN Tell you what happened, here to that treadle Bob, I couldn't get the jack and it - it - it made the hole oblong when I - but it's all right now.

CAPCOM Okay beautiful, beautiful.

CERNAN I mean it ended up all right.

CAPCOM Okay, and why don't we get you 2 guys together again, now, and break down the core and press on. And we've got a little revision here to the EVA, I'll get with you in just minute on, as soon as I find out what it is.

CERNAN Bob, I feel pretty good about that - that - that makes me feel pretty good.

SCHMITT Bag 174 - 474, 474 soil from next to this big rock it's the fillet, I can't get a chunk of the rock.

CAPCOM Copy 174 fillet beside the big rock. And Jack, while you're coming back here to the rover, why don't you get more rover sample in the vicinity of the deep drill while you and Gene get ready to take on the core stems. And because of being a little bit behind here, what we're doing is we're getting prepared to drop station 1^A in favor of doing Steno, over.

CAPCOM And I'll get with you on more details on that in a minute.

CERNAN Well how far behind are we?

CAPCOM Stand by.

CAPCOM You're about between 35 and 40 minutes and part of the problem is that we're a little short on oxygen on Gene's PLSS it looks like it's a 6 minute and 4 - 6 hours and 45 minute EVA from that point of view, which means that we have

CAPCOM to - we'd have to leave Station I too early, which is another - which is the reason to curtail Station I apart from just behind which is what the hooker was.

SCHMITT Okay, Bob, I'm approaching the rear of the rover. I've got the core, the cap, the wrench and the rammer.

CAPCOM Okay.

CERNAN I didn't mean to breath up all that oxygen.

CAPCOM Well, it's something you can't help. Even the surgeon agrees with me on that one.

CAPCOM And we're thinking Jack and Gene, what we're doing is planning on going to the west side of Steno and that boulder field that's partly out to Station I.

SCHMITT Okay, you want me to get a - you want to break that and I'll go get this sample, Gene.

CERNAN I'll break this Jack, no sweat.

SCHMITT Gene has pretty well chewed up the ground, I helped him, do you want me to get a little ways away from it.

CAPCOM Stand by, I don't think we're interested in a surface sample in the last top little bit ring, it's just a in the top - just a surface sample, stand by one.

CAPCOM Anything there in the dirt, Jack, it doesn't have to be a skim sample of any sort.

CERNAN Okay, Bob, I'm breaking down the core at the tail end of the rover, here.

CAPCOM Okay, congratulations.

CERNAN Well, don't do it yet, I haven't gotten it broken down yet.

CERNAN But I got it out of the ground with a little bit of help.

CERNAN Bob, it's full.

CAPCOM Okay, beautiful.

SCHMITT And I have to tell you which end I am taking it from.

CAPCOM Says we got the cap and alpha on one end and Bravo on the other end.

CERNAN Man, there's a cap that's going to be -

SCHMITT Okay, Bob mixture of soil and rock, in 475.

CAPCOM Okay, copy 475.

SCHMITT Soil came from about - the soil came from about 5 centimeters - 0 to 5 centimeters.

CAPCOM Okay, copy that beautiful.

SCHMITT And it's about 3 meters - 3 meters - 3 meters from the hole - well -

CERNAN Hey Bob, cap Charlie is opposite Alpha, that was the first 3 sections.

CAPCOM Okay, copy that.

SCHMITT 3 meters from the hole, I got stereo over 4 with - at 11 feet and one after at 11 feet.

CAPCOM Okay, copy that. And how about a frame count there, Jack.

SCHMITT Stand by.

END OF TAPE

CERNAN Okay, you -
SCHMITT No - now I can get it. Boy, this system
works good.
SCHMITT Okay, let me see. Let me configure the
old LSPE sampler here.
CERNAN Oh, oh boy, oh boy, oh boy, oh boy.
CAPCOM Jack, this is Houston, Jack, this is Houston.
Over.
SCHMITT Go ahead.
CAPCOM When you took those two pans, was
one at 15 feet and one at 20 feet?
SCHMITT One was in focus at 15 and 74.
CAPCOM Okay.
SCHMITT There's a partial pan - there's a partial
pan on mag A, which was taken at 15.
CAPCOM Okay, I understand.
CERNAN Okay, Bob - I can't see what it is - I
guess Delta and Echo is a 2 section core, Delta being adjacent
to the first section of 3.
CAPCOM Roger, copy that, Gene.
CERNAN Okay, baby, just go on now tight. The
last one is Foxtrot and it's on tight.
CERNAN Ow, arm smarts, it hurts, oh me oh my, I'm
going to take a big drink of water here. We got 3 cores, we
got the neutron flux down and we got 2 heat probes and ALSEP.
Don't care if we are 30 minutes late. Bob, did I give you the
last cap?
CAPCOM That's okay, Gene. We don't really need
it - the way they're broken down, there's no problem - the
32 pans out and the bravo on the bit end, there's no problem
there.
CERNAN Hey, what do you need, babe, can you pull that
off? Pull this off, yes. Rotated 180 there, no, no, just the
total thing that's good. There you go.
SCHMITT Like that.
CERNAN Yes.
CAPCOM Okay and 17 - go ahead.
CERNAN - to line it up.
SCHMITT I'm going to let you do it.
CERNAN I got it.
SCHMITT Okay.
CERNAN I'm doing the reading, Bob, before you
speak, let me get it over with.
CAPCOM Okay.
CERNAN It's 670 002601.
CAPCOM Did you punch grav. a second time,
that's identical to the first one.
CERNAN I just did to read it, that's what you
want, isn't it?
CAPCOM Yes, but you - did you punch grav. after
the first reading there at the ALSEP?

CAPCOM Or are you just reading me the same measurements you did before?

CERNAN Bob, I called them out every time.

CERNAN Bob, I'm reading it right here, everywhere I've punched grav, you've got it written down somewhere.

CAPCOM Yes, and I didn't copy your punches grav, but -

CERNAN Bob, I didn't. Bob, I did not - when I went to get the treadle on the neutron flux and rammer, I did not punch grav.

CAPCOM Okay, so that's the same as the first one, never mind, thank you. And guys - we're ready for you guys - as you go along here to do the geo prep and press on, as I say, we'll go to Steno and come back from there and do the SEP. Any questions about that? We'd also like to know if you have the gnomon, back of the Rover?

CERNAN Yes, we just -

SCHMITT Yes we do.

CERNAN Okay, lay core in - okay, Houston - can you put that in that dapper tool bag, there?

SCHMITT Yes, sir.

CERNAN We're configuring for geology, now, Bob.

CAPCOM Okay, copy that.

CERNAN Bob, right now 10 ECCO is in my suit pocket, I hope.

CAPCOM Okay.

CERNAN Okay, my 20 bag dispenser is in - we just need one, let me get it.

SCHMITT I've got mine on.

CERNAN Okay.

CERNAN Oh, this probably goes under the seat, doesn't it?

CERNAN The camera (garble) excuse me. Oh, I see the gnomon.

SCHMITT I put it there so I wouldn't forget it.

CERNAN (laughter) Okay, I tell you, if dexterity is the key, we might - look at those covers gloves.

SCHMITT I guess we can take those covers off, I don't know if we ought to or not.

CERNAN I'm going to leave mine for awhile, I changed my mind. I want to look at my gloves before I take them off.

CERNAN Okay, where are we? You've got your camera, obviously. This is my camera. I got the bad dispenser on it. It's not a bad days start. Bob, is the ALSEP working good?

CAPCOM The last we heard, it was working great, guys. We'll check again though.

CERNAN Okay. You got your camera - my camera,
the floor pan cap dispenser let me get that. Jack.
SCHMITT Yes.
CERNAN You haven't been on the Rover yet. It's real
easy, but it's also pretty easy to kick dust all over those battery
covers so don't even get on it till I put those covers down.
SCHMITT Yes, hey, I guess we ought to press on and
then we're going to station 1.
CERNAN Yes, you've got to walk back to the LM anyway
- we got to -
CAPCOM Roger. We are going to play it per the check
list. Jack will carry the things back, and Gene will get the thing
alined, and we'll go out to the SEP sight, and then we'll press
on from there down to Steno. Over.
CERNAN Okay, very good.
CAPCOM And right now -
CERNAN You want to come over here and I'll stow your
PLSS?
CAPCOM Go ahead, never mind.
SCHMITT Yes.
CERNAN My camera's under my feet. Okay, you can turn
around, oh man, what have you been in? Hallelujah.
CERNAN I'll keep the hammer, I'll give you this, can
you reach the rammer, it's right in front of you?
SCHMITT Oh, yes.
CERNAN Let me - haven't got this cap in yet - there
it is. Okay, the caps are in. Here it is.
CERNAN The caps in.
CAPCOM (garble)
CERNAN Okay, Bob.
CAPCOM Yes, we're going to hand over (garble)
CERNAN (garble)
CERNAN Okay, rammer, I got the hammer, turn around,
I'll give you as CB2.
SCHMITT Okay.
CERNAN Now guess how these hooks are going
to work. Oh, man, like a charm so far. Oh, except your
doggone harness is off, too, Jack.
SCHMITT Is it?
CERNAN Yes, okay, you've got to undo the strap.
SCHMITT Let me get at it.
CERNAN You got to loosen that strap and then just
put her underneath and tighten it up again.
SCHMITT This one here?
CERNAN The one on my right, yes.
SCHMITT I might turn around then, I could -
CERNAN No, on your right right there.
SCHMITT I think it is - yes, that's where it is
on yours.
CERNAN Yes, I'd like to make sure the other
sides alright though.
SCHMITT Oh, okay.

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SCHMITT Let me. I got it so tight now. Okay, now
I got it.

CERNAN Okay.

SCHMITT Okay, now I'll get this hook.

CERNAN It's going to be a piece of cake, Jack.

END OF TAPE

CERNAN Hello, that's going to be a piece of
cake, Jack.
SCHMITT Keeping and it's all on and lock. Okay.
You got a CB 2, you got the rammer, you got the cap dispenser.
Okay. You can secure SCB 1. Doesn't this go under your -
CERNAN Not yet, I don't think. I think it stays
there.
SCHMITT This does.
CERNAN Now it does - yeah. That goes under
the seat.
SCHMITT And this goes here.
CERNAN Yeah.
SCHMITT Okay.
SCHMITT Bob, the long cans going under my seat.
CAPCOM Okay. Copy that, Jack.
CERNAN They got a handover, I think.
CAPCOM Handover's complete, guys.
CERNAN Okay.
PAO 4 hours 30 minutes into the EVA.
CERNAN Okay, you can pull it off.
SCHMITT It's unlocked.
CERNAN It's unlocked.
SCHMITT There it is. It's usually stiff.
Okay. For once, I have my camera off.
CERNAN Did you get the heat flow pictures, by
the way.
SCHMITT I got most of them. Not all of them.
They revised the whole camera.
CERNAN Hey, Bob, is it going to hurt to leave the
UHT and the heat flow electronics on.
CAPCOM Stand by.
SCHMITT Wait a minute. I ought to get that, I guess.
CERNAN One - -
SCHMITT Pull.
CERNAN Here, let me lean down.
SCHMITT Two, and the hook's still hooked.
Check for sure. Those hooks weren't designed for new bags.
CAPCOM Okay, Jack. They don't want us to use
(garble) you guys, when you get to it, pull it out.
SCHMITT (garble)
SCHMITT I'll get it right now.
CAPCOM Thank you.
CERNAN Watch the alignment as you said.
SCHMITT Yes. I sort of thought you might like
it out of there. Let's stay away so I don't get a cable
and I don't get dust in the mirror. The alinement is still

SCHMITT good.
 CAPCOM Okay.
 CERNAN Now, if I can get it out.
 SCHMITT I'm going back to the LM.
 CERNAN Okay, Bob, the alinement's good on the
 heat flow and I got the UHT out. Jack, do you need this?
 SCHMITT You better leave - save it. Save it.
 CERNAN I'm going to leave it right here by the
 ALSEP.
 SCHMITT Save it. Careful.
 CERNAN Jimminy, I just threw it right here in
 this little ditch.
 SCHMITT Yeah, right.
 CERNAN The other UHD is by the ALSEP. We
 probably ought to have it with us, Geno. For the sampler.
 CAPCOM Have you got one UHT sampler.
 SCHMITT You've got one - that's all right.
 CAPCOM Okay, we gather you on the way back to
 the LM with the core sensor, Jack.
 SCHMITT Yes sir.
 CAPCOM Okay.
 CERNAN Okay, Bob, I'm going to take the TV away
 from you and get these battery covers squared away before
 I put the tongs and the camera on.
 CAPCOM Okay, Geno, and you guys have the
 gnomon and the little quiver, right?
 CERNAN Yes, sir. The temperatures on the bat-
 teries are 96 and 110.
 CAPCOM Okay, thank you.
 CERNAN Can I close the cover?
 CAPCOM Roger.
 CERNAN Can I close the cover?
 CAPCOM Roger, roger.
 SCHMITT Hey, you're turning our voice around,
 Bob. We're getting a repeat.
 CAPCOM I said close the covers please.
 SCHMITT That's right. I heard what you said,
 but you're turning our voice around.
 PAO Jack Schmitt on his way back to the
 lunar module.
 SCHMITT (Singing) I was strolling on the Moon
 one day, in the merry merry month of December -
 CERNAN May - May's the month.
 SCHMITT - May - that's right.
 CERNAN May is the (garble) month.
 SCHMITT - when much to my surprise, a pair
 of funny eyes (singing)

CAPCOM Sorry about that, guys, but today may
be December.

CERNAN Okay, and the battery covers -
SCHMITT (Humming)

CERNAN Okay, Bob, the battery covers are closed,
I'm ready to go mode switch 1. I guess I'll just wave good-
bye. You look pretty clean. I won't touch you.

CAPCOM Okay, thank you.

CERNAN Oh, man, it's even hard to move you
counterclockwise. Here we go. Counterclockwise, facing
aft. Okay, I'm going to mode switch number 1.

CAPCOM Rog, we can confirm that.

CERNAN - and you want me to leave those two
blanket switches 100 percent, right.

CAPCOM Roger. That's affirm.

CERNAN Okay, now I got to mount my camera
and cover my tongs - -

PAO We'll lose TV while Gene Cernan drives
the Rover to the surface electrical property site, about
100 meters east of the lunar module.

CERNAN Okay, mount camera, covers tongs. See
if my camer's going to work. Bob, I'm on Bravo - mag Bravo
and frame count 19.

CAPCOM Okay, copy that, Gene.

PAO Jack Schmitt has carried the core stems
back to the lunar module where he will pick up the transmitter
for the surface electrical property experiment and carry it
out to the site where it will be deployed.

CERNAN - - 185 and I'm on - still intermediate
cooling.

CAPCOM Okay. Copy that.

CERNAN Okay, inventory. Camera -

CAPCOM Okay. Copy that.

CERNAN - tongs, gnomon, okay, I'm ready to get
on. Ready to get on. Okay, you want us to make the (garble).

SCHMITT That rock by your front porch is really
a major nuisance.

CERNAN Oh, doggonit.

SCHMITT What's the problem.

CERNAN Oh! Every time I get on, I kick dust around.
I still haven't learned how to get on yet. You think after
three times, I'd know better. I know better, but it's -

SCHMITT Okay, I've got the transmitter. I'm
heading west. Or east. Heading east. Sorry about that.
Okay, I'm primary. Okay, you want an - to have initial of
your high, Houston.

CAPCOM That's affirmative.

CAPCOM That's affirmative.

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SCHMITT By the way, Bob, Station 6 is pretty obvious up on the hill. It's fairly high up. I don't know whether we'll get to drive up there or not.

CAPCOM Okay. You can see the boulders and that's how you can tell, right.

SCHMITT Yep, and the crater. A shame not to - well, maybe that's the wrong one. I'll have to check the map. A shame not to go to Station 1 - -

END OF TAPE

SCHMITT - to go to Station I.
CERNAN Sure is a shame.
SCHMITT Why don't you consider Station I as a
possibility. Okay, Bob, let me give you some numbers.
CAPCOM We're ready.
SCHMITT Sun shadow is 0 -
CAPCOM We're ready.
SCHMITT I am rolled it right 4 degrees, I am pitch
0.
CERNAN I can't be rolled right 4 degrees, that
indicator can't be right.
SCHMITT I question that.
CERNAN The roll indicator's right, I might be rolling
left a couple of degrees.
SCHMITT Are you happy with that Bob, our roll indicator
is indicating - make it 3 degrees - 3 degrees right.
CAPCOM Okay, and I copy - okay and I copy - okay,
torque to 279 will be the heading, 279.
CERNAN Okay.
CERNAN Okay the heading when I put the nap power
breaker in Bob was 23 - 234.
CAPCOM Okay, I copy that we'll torque that to 279.
CERNAN Okay, I'm waiting for my minute and a half
here.
CAPCOM Roger that.
PAO Steno is a crater about 1 kilometer south
and east of the lunar module.
PAO Station I was -
SCHMITT LMP is 39 percent 3.88 and no flags, no tones.
CAPCOM Okay, Jack, copy that.
SCHMITT I'm at the sep sight, and I found a place
I think we can lay out a pretty good grid.
CAPCOM Okay, Jack, and when you lay it down there,
we want to put it down with the gnomon side away from the Sun
(garble) a thermal constraint this evening just as the EVA started.
SCHMITT Okay, away from the Sun, gnomon, do you want
the gnomon side or corner?
CAPCOM The gnomon side away from the Sun, the side
with solar pan needs to be in the sun. The sides with solar panels
don't have to be in the shade.
SCHMITT Okay.
CERNAN Bob, everything's working fine so far,
she's zeroed and I'm torqued, and I'm ready to press on, reset
is back off, okay Jack here I come.
SCHMITT Okay.
CERNAN See me?
SCHMITT No, I'm facing the other way.
CERNAN (garble) about all you can see in that direction
is the LM, boy that's tough driving in the sun.
SCHMITT Go right to the LM and then a little bit to
your left, to the left of the LM.
CERNAN Yeah, I've got to go to the LM and get my
reading here.
SCHMITT Okay.

CAPCOM That's affirmative, Gene.
SCHMITT You get in that shadow up there and you're all right.
CERNAN Say again, Bob?
CAPCOM That's affirmative, we want the range and bearing at the LM, I'm glad you remembered.
CERNAN Yes sir, I'll give it to you. I even got oh, oh don't get in there. I even got the low gain working for you, I don't know if you're using it.
CAPCOM I think we're using the LM right now.
CERNAN Boy that LM is pretty, whew!
SCHMITT Bob, everything I've seen so far indicates that the so called sub-floor boulders if we have gotten that deep are this gabbro. I'm out here at the SEP site and the large blocks are filled with plagioclase dirkscene -
CERNAN Jack, let me give them a range on me on my way out.
SCHMITT Go ahead.
CERNAN Okay, bearing 292; .2 and .2, I'm standing right in front of the MESA.
CAPCOM Okay, beautiful Geno, thank you.
CERNAN Okay, I'm coming Jack.
SCHMITT The zap has nice white halos although for the most part the rock's too coarse to show them very well. Some of the larger ones have white halos. We may not be down to the sub-floor, but it's hard to say.
CERNAN Hey, Bob, making 8 to 10 kilometers, and I'm barely moving.
CERNAN Where've you got the sep Jack?
SCHMITT Right out over there.
CERNAN Okay, let me give them bearing, distance and range and some numbers here.
SCHMITT Meet you over there.
CERNAN Okay.
CERNAN Oh.
SCHMITT Bob, I did see a dense grey rock that's different than the others on my traverse out here, we'll try to find some of that too.
CERNAN Okay Bob, I'm reading 278, 003 and 003 at the sep site.
CAPCOM Okay copy that Geno, and how about giving me amp hours and batteries just as long as you're there.
CERNAN Yes sir, it's coming at you. Amp hours are 112 and 110, batteries are 9 - 92 and about 1 oh 112.
CAPCOM Okay copy that Geno.
CERNAN Voltage are all off scale low.
CAPCOM Yeah, okay thank you.
CERNAN And we are going to reset.
CAPCOM Say again there, Gene, you're going to go to reset, right?
CERNAN Yes sir, going to reset.

CAPCOM Okay.

CAPCOM Jack, you can be getting on, you won't need the bomb and I guess you won't need the LMP camera unless you want it. You'll be deploying the bomb at Steno.

SCHMITT I thought we were playing it by the checklist
Geno, here's the bomb -

CERNAN Okay, give it to me.

SCHMITT charge.

CERNAN I've got it.

CAPCOM Yeah, it just happens that the station is
at the place we're going to deploy the charge.

SCHMITT Okay, well we got it off.

CERNAN Do you know which side of Steno he wants us
to go Jack?

SCHMITT Not yet.

CAPCOM Yeah, we're going - okay let me fill you in
on the plan, guys, we're going to go to the west side of Steno
which is where you would have driven by anyway, and the stop
will be at the 340/1.2 which is the little Delta for EP 6. Plan
on spending 30 minutes there sampling primarily boulders.

END OF TAPE

SCHMITT Okay, Geno, west side of Steno there.
CERNAN Okay. I got it here.
SCHMITT You got a good feeling on how to head out
of here.
CERNAN Yeah. I want to get around the back side
now that I'm down there on the back side of Trident, and make
sure that that's what I'm looking at, is Trident over there.
SCHMITT Okay, let me try to get on this thing.
CAPCOM Okay, 17, just to fill you in a little bit
more here. We're looking at a 6.45 EVA, we've given you 15 minutes
to drive to station 1, 30 minutes at station 1, and 15 minutes
to drive back to the SEP and deploying the SEP for 22 minutes, and
then a 40 minute closeout at 6 plus 45.
SCHMITT I'm sorry Bob, after 30 minutes at station 1,
what did you say?
CAPCOM Okay, and then we're going to drive back, and
there's a 15-minute return to the SEP sight and then 22 minutes
at the SEP sight to deploy to the SEP and then, return to the
LM in 45 minutes for the close out.
SCHMITT Okay. Understand.
SCHMITT Okay, you strapped yet?
CERNAN Yes sir.
SCHMITT Yeah, we've starting getting this Rover to
facing a 90 degree to the seats I think.
CERNAN I did the same thing.
SCHMITT Right through dust?
CERNAN Yep, we both did.
SCHMITT I tried to knock it all off my feet.
CERNAN Yeah, it's impossible.
CERNAN Okay, Jack. Let's see if we can't get
around - around Trident east over here.
SCHMITT I wish I didn't have this charge. Should
have played it by the checklist. I wasn't paying attention.
CERNAN Okay, -
SCHMITT We're on the move, Bob.
CERNAN Okay, this is Trident, isn't it.
CERNAN We're starting out.
SCHMITT Yeah, it's got to be.
CERNAN Yep. So, you're starting out on the -
You really want to hit about 29 - No, no, no, no, wait a minute -
we want to go south east 181 - -
CAPCOM 17, we'll start out on the same general
traverse that you've been on. It's just that we'll stop it sooner.
SCHMITT Yeah, we understand. We're -
CAPCOM Okay.
SCHMITT We're just getting out bearings, Bob.
CERNAN This has got to be Trident east, right here
Jack. See that. That's got to be Trident east. That's the
big one.
SCHMITT On the right or the left.
CERNAN On the right. Yeah.

SCHMITT And we - Poppy - We're just over about where -
CERNAN (garble)
SCHMITT Yeah.
CERNAN Just want to get our bearings. We can't
look to the east.
SCHMITT Okay.
CERNAN I got it. That's an awful big depression
over there, isn't it. We could go along this way.
SCHMITT Boy, it sure is.
SCHMITT Whee.
CERNAN Watch it, hold it , hold it hold it.
(garble) Boy, I tell you I've got to get out east.
SCHMITT Stand by.
SCHMITT Gene, I think I'm going to head about 120 out
of here.
CERNAN Well, you've got another hole on your right here.
SCHMITT I got it.
CERNAN Whoa, whoa. I'm not sure which way - why
don't you go left here. Go left around this thing.
CAPCOM And 17 Houston, for you advice, we're trying
to use the low gain antenna on this traverse also. Might try
and be good guys and turn it for us when you have to.
SCHMITT Okay. Bob.
CAPCOM That's general reminder #1.
CERNAN Gene, I think we need to head south.
SCHMITT Yeah. We've got to go out here southeast.
What's that big map look like in relation to Bear Mountain
to you.
CERNAN You mean the - I'm not sure I can get to it.
Okay. Okay, it calls for 116 at .6 (garble) SEP.
SCHMITT I ended up with the charge in my hand.
CERNAN Ther's a big, what are you headed now, south
pretty much?
SCHMITT Yeah. Right here.
CERNAN I think you're getting - That must be
station - that must be Emory over there. See with all the
blocks in the wall.
SCHMITT Where you looking, which way.
CERNAN South east.
SCHMITT Way over there.
CERNAN Yeah.
SCHMITT That may very well go - this is very easily
Steno right over here. Let's see we're between the 2 big ones -
CERNAN That would be Powell -
SCHMITT That would be Powell on the right, you think?
CERNAN Certainly doesn't look like the LNA yet.
SCHMITT No, it sure doesn't.
CAPCOM How about a range in bearing, guys, if we can
help you.
SCHMITT Okay, 330.3
CAPCOM Okay, it sounds like you're probably just
driving by the east Trident or Trident 3.

CERNAN You call that right there is Trident?
 SCHMITT By God, if it is that's incredible. That's hard to believe. Well, you're going to go in a hole in - you're right, no problem.
 CERNAN I can't see the lip too well 'cause of the - well if that's Trident -
 CAPCOM Okay, and Jack if you - do you have your camera on, if so, could you give me a frame count some time?
 SCHMITT Bob, I've got my hands full with this charge.
 CAPCOM Oh, okay, they forgot about that one, sorry about that.
 SCHMITT Looks like 45.
 CAPCOM Okay, copy that. Thank you.
 CERNAN Boy, if that's Trident, Whoo
 SCHMITT Hey that is - don't you suppose that's Trident?
 CERNAN Well, it looks like it doesn't it.
 SCHMITT Yeah, we were quite a ways from Trident.
 CERNAN I bet you it is.
 SCHMITT If that's true we're at about 42.4, that's about right, we're half a mile - that's about right. Well when I was looking at Trident it isn't nearly anywhere near that big.
 CERNAN Okay, if that's true and we want to go 181
 SCHMITT Yes sir. We're all right now. That's got to be Trident. What we were looking at before. - I've got to stop and see what that is. I've got to look at this map when we get in.
 CERNAN Well it's a triplet all right, with a septor between.
 SCHMITT Well, wish I could take pictures. Take a few, but -
 CERNAN Well, let me get a few here. All right keep pressing.
 SCHMITT (garble) We can get them coming back.
 CERNAN Take a few, but it's not continuous, my hands are giving out. I wish I hadn't said, "Follow the checklist." Okay, we're at .5 and 346. And the surface has not really changed except slightly more hummocky and rolling, because of a larger number of irregular depressions, or craters. The boom - The rocks at first glance from the Rover, look very much like what we had around the LM. That's the big ones.
 CAPCOM And 17, you might be - Jack, you might be expecting water flag and a tone in a couple of minutes, go to OX.
 SCHMITT Okay.
 CAPCOM And CDR will be about 5 minutes after that.
 CERNAN I'll get stopped here in a minute, Jack, as soon -
 CERNAN Okay. I think maybe that might be Steno over there -
 SCHMITT I don't think we're too far off. Okay, there's my - I've got to go to OX.
 CERNAN Can you reach it?
 SCHMITT I hope so.
 SCHMITT Okay, Houston, do you see me in OX?

CAPCOM Stand by. Roger. We see you in OX.

CERNAN I'm going to hit some of these broadside,
Jack, and then we won't get any roll angle.

SCHMITT Okay, how far in do you come?

CERNAN I've got to go .7 - about another .7 mi - kilo-
meters. I may be coming up on the edge of it, but I don't know,
I'm - I'm on the right bearing. Yeah. We're all right.

SCHMITT Steno has got that dimple on the North.
Boy, this is a heck of a way to start out our navigation 'cause
it's into the crosssun here, not cross sun, but sun. Now, that's
got to be Powell, wouldn't you say?

CERNAN Ah, yeah.

END OF TAPE

SCHMITT - must be, must be. That's Steno with all the blocks in it.

CERNAN Boy, am I glad we didn't land out here.

SCHMITT See this high point out there coming ahead.

CERNAN Yeah.

SCHMITT That should give us our bearing I hope. I can't hold that bomb any longer.

CERNAN What are you going to do with it.

SCHMITT I'm going to drop it at my feet.

CERNAN Okay.

SCHMITT Okay, it's there.

CERNAN Keep it between your feet.

SCHMITT It will.

SCHMITT My hands aren't going to be any good for sampling.

CERNAN Okay, that's Powell, huh?

SCHMITT Yep.

SCHMITT Okay, if that's Powell, why don't we go over there? Think the thing to do is get up on that little ridge there.

CERNAN I think we may end up looking right into Steno when we get up there. Bob, we're 342.9.

CAPCOM Okay. Copy that.

CAPCOM 3.0 and 1. -

CERNAN Are you reading the low gain, by the way?

CAPCOM Yeah, roger. Beautiful. 340 and 1.2 is what we expect the station to be.

CAPCOM And it should be up on the top of a little bit of a rise. That you see coming up there. Almost to that rise. You ought to be in the vicinity of a very large boulder.

CERNAN Houston, there's a - there are certainly a lot of big boulders - whoops! Let me take a look into the Sun here. That doesn't look what I thought Steno looked like. There's no dip there. 1.2 he said. All right. This is it over here, though, I guess.

CAPCOM Yeah, Steno ought to be at - right close to 9 o'clock there, Gene.

CERNAN At my nine o'clock. Yep.

CAPCOM Either that or your three o'clock.

CERNAN How do you know where we are?

CERNAN I think you're probably right, although it doesn't impress me as what I saw in the LNA. How much time have we got to drive now, Bob?

CAPCOM Okay, stand by.

CERNAN I think that's probably Emory up there.
That's Steno, I guess.

CAPCOM Yeah, Gene and Jack, we'd like you to
if you're in the vicinity, we think you're just about there.
We were planning on you leaving the set and getting to this
place at about 4 plus 58 and we're showing about 5 plus 00
right now so you're right on time. And if you're at 340
and 1.2 in that vicinity, you must be at the station or
very to it where you can see. Over.

SCHMITT Well, it doesn't look real familiar
Bob, as far as Steno's concerned. Okay, I got - I think they
can locate us if we work that block field right there.

CERNAN Let me get my water.

CAPCOM Okay, on the map we're showing, Jack,
that you're probably looking at, you're seeing that there's
a couple of boulders just above at about the - with north
being 12 o'clock, there are a couple of boulders at 9:30
position on Steno and then there's a couple of more at about
the 9 o'clock position on Steno and we're putting the
station right in the midst of all those boulders. Over.

SCHMITT Well, Bob, I don't know. It's hard to
follow that that's where we are. I'm not sure. It doesn't
look like what I expected Steno to look like - -

CERNAN No, me neither.

CAPCOM Okay. What's the range and bearing
one more time.

SCHMITT Okay, 346, 1.1. I think it would almost
be worth - I bet that's Emory up on that hill. It's got
to be.

CERNAN Yep.

SCHMITT Okay, well let's - we're approaching
a boulder field here. Wish we could have gotten near one
of the big ones, but let's do it. We're going to run out of
time.

CAPCOM That's affirmative, guys. There's no
point in deviating around and spending 15 minutes trying to
get to a particular spot or down to a bigger boulder.
You must be near the vicinity. If you're really worried
about it, I guess you might drive a little to the east
of the crater, unless you're there. Over. Your judgment.

SCHMITT No, we're okay. We got a good place.

CAPCOM All right.

SCHMITT Okay, I'm parked 180.

CAPCOM Roger. Stand by a minute.

CERNAN You want us to get off. What do you
mean?

CAPCOM Okay. I was just wondering about where
you were going to park. Go ahead and park 180.

CAPCOM I was questioning whether they wanted
us to park into the Sun.
CERNAN Okay, I'm heading - -
CAPCOM 180 is a good heading.
CERNAN Okay, I'm headed - I'm headed 182 346,
1.2, 1.1, 110, 108, 100 and 118, and offscale on all of
the boulders.
CAPCOM Okay. I copy that.
SCHMITT Bob, can we deport.
SCHMITT Okay. You want this charge deployed
here?
CAPCOM That's affirmative, Jack.
SCHMITT I can deploy it now.
CAPCOM You can deploy it now, that's good.
PAO That's a one-pound charge for the lunar
seismic profiling experiment.
CAPCOM Beautiful, we'll give you the Caper of
the Year Award.
SCHMITT Boy, you're going to have to give me the
Dunce of the Year Award after this.
CERNAN Bend Y.
CERNAN Two, mark, safe. Bend three mark safe.
SCHMITT That will be in the pan, Geno.
CERNAN Okay.
CAPCOM Okay, I copy that.
SCHMITT Bob, you got (garble)
CAPCOM We can confirm that is a EP 6, right?
CAPCOM 17, Houston. Do you read?
CERNAN Okay, Bob, we're about 15 meters from
a 20 meter blocky rimmed crater, it's about 3 to 4 meters
deep. All the blocks on the rim like the pyroxene,
plagioclase, gabbros and vesicular rocks - seen at the LM.
At least all that I've seen so far.
CAPCOM Okay. I copied that, Jack.
And is this crater to the east or west?
SCHMITT It's to the northwest of the Rover.
CAPCOM Okay, copy that.
SCHMITT The vesicle population - the vesicle
population varies from about a millimeter to one centimeter.
It forms about 15 percent of the rock - 10 to 15. And I've
given you grain size and - for the rocks near the LM and
that goes for well for this one.
CAPCOM Okay, I copy that, Jack. Very good.

END OF TAPE

CERNAN There is - the parting that I mentioned, still of somewhat unknown origin, and we'll try and get a sample along a parting plane. It's fairly evident in one of the bigger blocks.

CERNAN Okay Bob, just as we stopped the Rover, I went on OX water, do you want me to turn my primary water off - I don't have to do I?

CAPCOM No, no, no need to.

CERNAN That's what I figured. Just wanted to cover all bets. Okay, Jack. I think, I've got my housekeeping done.

SCHMITT Okay.

SCHMITT Hey, get your hammer, we're going to need it.

CERNAN I've been carrying it all day, it's about time I used it. Okay.

SCHMITT Bob, you're going to want a core at this site?

CAPCOM Roger, we'd like to get number 1 priority, will be some black samples, including any dirt that was on the blocks, if there is such, and then the second priority is a rake soil sample, the third priority is a double core. Then, also in there, the pans, of course, and other documented samples. But double core is there, although it is third priority.

CERNAN Okay.

SCHMITT Gene, do you think, got your gnomon, huh?

CERNAN Yes, I've got my gnomon and I've got to get with GGE. When you said, bring a hammer I came -

SCHMITT I'm sorry.

CERNAN No, no problem.

SCHMITT Well, I shouldn't have -

CERNAN The two go hand in hand.

SCHMITT Nothing disrupts your thought patterns more than somebody saying something.

SCHMITT Well, listen, this is my first geology stop. I guess I'm entitled to do that, Bob, you ready for a mark?

CAPCOM Roger.

SCHMITT Okay, mark it, the lights flashing.

CAPCOM Copy that.

CERNAN Okay, you got one picked out?

SCHMITT Yes, let's hit this - should be able to work on that one, it's up to the edge, but we can chip it - the parting plane, and that's one of the things that's come up that I think is of interest, we've got to figure out why they have that foliation in them.

CERNAN Boy, that rock is one of the vesicular ones I've seen around.

SCHMITT They're all about that - Gene, they're too - they're either that or mixed with that variety - in the same boulder you'll see a non-vesicular - a relatively nonvesicular. Okay, that's the, watch your shadow, that's the down sun. Oh, Okay, right into the sun.

CERNAN Okay.
SCHMITT Right at that overlapping fracture, huh?
CERNAN Yeah, let me get where I can maybe save
the rock.
SCHMITT If you can hook your -
CERNAN That's what I'm going to do, I'm going to
try and get it right up on top is where I'd like to -
SCHMITT If you hit it on the right side, it'll
go this way, maybe. There you go. Good man.
CERNAN He's right there.
CERNAN I can get another one, too.
SCHMITT Try another one.
CERNAN Don't lose that one. Let me get that one
for you.
SCHMITT I can get it.
CERNAN oops.
SCHMITT Can you keep it in sight here for a
minute. Is that it?
CERNAN Yes.
SCHMITT Go ahead.
SCHMITT Try hitting, there you go. Can you use
the other end against the right side of the rock?
CERNAN I'm pressing.
SCHMITT Oh.
CERNAN It's coming.
CERNAN That's alright.
SCHMITT I'll get that one, wait a minute.
CERNAN Be careful down in there.
CERNAN The whole thing is going to fracture
off here, in a minute.
CERNAN That's why -
CERNAN Trying.
SCHMITT It's trying to fall. Don't wear your
hand out. That's good, Gene.
CERNAN Wait a minute. Let me give one more
whack. The whole thing is - no that's too tight, let me get
that other piece -
SCHMITT Okay, bag 476 is the rock sample with a
little bit of the soil near it - With a chip - Chip off the
rock, and it's the - watch it Gene.
CERNAN Here's your other chip.
SCHMITT If I go down there, that thing is about
15 feet deep.
CERNAN Right, got it.
SCHMITT Okay, now, do you think you can chip off
of the other side of that plane, up on the edge?
CERNAN Yes.
SCHMITT Then we'll get the soil, and maybe just
a small rock, one non chipped.
CERNAN Let me tell you - my hands from that drill -

SCHMITT Yes, I'm sure they are.
 CERNAN I really know I've been out here today.
 SCHMITT 476, Bob.
 CAPCOM Copy that, Jack.
 SCHMITT It's from the southeast side of the parting
 plane -
 CERNAN There's a whole big slab, right there.
 SCHMITT Okay, very good.
 CERNAN Oh, look at those dark minerals in there,
 are those dark black?
 SCHMITT Yes, they may be ilmenite or fresh
 (garble) we'll look at it. Gives the impression (garble)
 SCHMITT Okay, you want my bag.
 CERNAN I tell you, if you work on any kind of
 slope, like this little crater -
 CERNAN Okay, I'm going to leave it open for a
 minute.
 SCHMITT Okay.
 CERNAN While we get that one.
 SCHMITT You're going to have to use your tongs on
 that one, I think.
 CERNAN Okay. I got it.
 CAPCOM And 17, a reminder to factor into your think-
 ing, this is only a 30 minute stop and there's about 20 minutes
 remaining.
 SCHMITT Yes, sir. But we got to sample something.
 CERNAN Here's a big one, get me bag number 2.
 SCHMITT Bag 454. Okay, and the flashes are from
 inside of (garble) and recrystallized vesicles. They look like
 pyroxene flashes, they could be ilmenite.
 CERNAN I'll get my after picture here.
 SCHMITT Okay, and let me get in there and get some
 soil.
 CERNAN Okay, let's get it first.
 SCHMITT From the north side, woops, okay, the bag
 tore around that, it's pretty jagged rock, but I think it'll
 hold.
 CAPCOM Okay, copy that.
 SCHMITT In yours, okay. It's in Genes sample collection
 bag. And a scoop sample. You got a bag handy, Gene? Okay,
 bag 455, Bob. It's from the west side of the rock. It's under a
 slight overhang of the rock - in a shadow, anyway. Okay, that's
 from about 1 centimeter downdeep, 1 to 2 centimeters, and the next
 one is down to about 5, 5 or 6, and it's got some chips in it.
 That's bag 456, Bob.
 CAPCOM Copy that.
 SCHMITT Okay. (laughter)
 CERNAN I know. Oh shoot.
 SCHMITT 1.2 in kilometers is a long way from the LM,
 look at the Challenger down there. Makes you get a feel for how
 big this valley really is.
 CERNAN I'd rather not.

CERNAN Okay. I'll help you.
SCHMITT I got it.
CERNAN Turn around and let me help you get these
in your bag.
SCHMITT I learned how.
CERNAN You learn of necessity out here.
CERNAN Okay.
CERNAN See if we can't fill this up for Christ-
mas. Okay, lets - you happy there?
SCHMITT Yes, let's - get your after - and if
we can, we might get just a block instead of breaking on it,
and then we'll go to the rake.
CERNAN Let's go around to the - Bob wanted a core
here, too, huh?
SCHMITT Yes, but the rake's next, as you might
imagine. Geno, now this looks a - this stuff here looks a
little less vesicular, why don't we try that one.
CERNAN Hey, look at this rock, where the
vesicularity changes from a hummocky vesicular to a very
fine vesicular, look at this. Let me try and crack - get a -
see that? The change?
SCHMITT (garble)
SCHMITT Yes, that's what I'm after, that's it.
Let's see if I can't crack -
SCHMITT That's it. That's what I saw in that
other boulder.
CERNAN Let's see if I can't crack the corner
and get that contact.
SCHMITT You ought to get a piece of both, I
think you can get, if you can reach down there.
CERNAN See if I can't get a -

END OF TAPE

SCHMITT That's a contact in a rock.
 CERNAN Yep.
 CAPCOM Beautiful. And you guys - do you guys see any 2 meter boulders around there?
 SCHMITT We just sampled one.
 CAPCOM That one showed up in the photos, I wonder why those down at the ALSEP didn't show up.
 SCHMITT No, we're not where you think we are. We're not sure where we are. Gene, can you get down into that.
 CERNAN Need some help?
 SCHMITT Yeah, just - give me the shovel to hold myself with, give me the shovel.
 SCHMITT How about that one?
 CERNAN Yeah.
 SCHMITT Get that little piece.
 CERNAN Okay, I see it.
 SCHMITT It's pretty hard, see if I can't - it's a little hard to hit.
 CERNAN How about coming around from this side.
 SCHMITT Well, I got the gnomon in the wrong place really.
 CERNAN Let me see here.
 SCHMITT Can you reach it.
 CERNAN Well I'm going to lean on the rock maybe. I got that other little piece in sight.
 SCHMITT Okay, I got that piece in sight, let me -
 CERNAN Get them both through here.
 SCHMITT Let me get a (garble) right now.
 CERNAN You can stick that in the ground if you.
 SCHMITT Okay, this is a sample of the - of the more coarsely vesicular rock.
 CERNAN You got it in your hand.
 SCHMITT I got them both, I think actually we want a sample of both sides, but I wouldn't bet on it.
 CERNAN Okay, I got a chunk of that side.
 SCHMITT Okay, I got both of these.
 CERNAN See that rock right over there on the little mound, just projecting on the edge of it?
 SCHMITT Where are you looking?
 CERNAN Right over there.
 SCHMITT Here?
 CERNAN No.
 SCHMITT Here?
 CERNAN - where I'm pointing.
 SCHMITT There?
 CERNAN There you go, you just about touched it. Right there, that piece.
 SCHMITT Okay, let me get these in a bag here.
 CERNAN Well I'll get that piece, and that's the sample from either side of the contact anyway.
 SCHMITT Did you get a bag?

CERNAN (garble) Give me the hammer, I'll get a bag -
SCHMITT - you take the hammer, I got these in my
hand I want to put -
CERNAN Okay.
SCHMITT Okay bag 477 is coarsely vesicular rock.
CERNAN Are 2 of them there? I hope 2 of them fell
in.
SCHMITT No, I only got one. Okay here's that other
one, it had to fall right here. I don't think it ever - there
it is; get your tongs.
SCHMITT Right here?
CERNAN Now you're full of dirt in the scoop, you
just covered it up.
SCHMITT Got it, I got it.
CERNAN Okay, put it in here with the dirt, that's
good, a little dirt never hurt anybody.
SCHMITT Got it.
CERNAN Okay.
SCHMITT 477 are 2 chips of the small, I think that
will give you, if there's any compositional difference.
CERNAN These 2 are the ones you saw, right there?
SCHMITT Look what you pointed at. Yeah I think you
got it.
CERNAN Okay. I'm going to take a close up stereo
on that contact.
SCHMITT Yeah, definitely.
CAPCOM Okay, and Jack and Gene, when you get done
with that boulder, we'd like you to move one to the rake soil
sample, please, and that'll be a kilogram sample please.
CERNAN Yes sir, we're going to - we're going to.
SCHMITT In bag 478 is the chip from the finely -
more finely vesicular rock. Both of them are coarse. It's
a small chip, but it'll tell the story, I think.
CERNAN Dust, dust, dust, dust, here you are. I'll
go ahead and get a close up -
SCHMITT - get a close up and I'll get the rake. I'll
get started on the rake.
CERNAN Okay.
SCHMITT Gene, if you can pickup one more rock in
that picture, with your tongs, let's bag it.
CERNAN I'll get it.
SCHMITT As you come back.
CAPCOM And 17, we'd like to have you guys driving
in 10 minutes, please.
CERNAN Nag, nag, nag.
CAPCOM That's right, that's right.
CERNAN I can't see my camera setting it's so full
of dust.
SCHMITT Okay, I guess you want a sort of out in noth-
ings land here, huh?
SCHMITT I can bag it for you Geno.

CAPCOM Roger.
CERNAN That's all right, I want to get this close up here.
SCHMITT Okay, I moved about 5 meters - 5 - 8 meters northeast of the rover, and as soon as Gene gets here with the gnomon.
CERNAN Coming, coming.
SCHMITT Bob, I've got a sample that was laying next to that boulder, I didn't get an after picture of it but, as I was taking my close up pictures it is on my side of the boulder just 4 or 5 inches covered with the dark mantle.
CERNAN I think we probably disturbed that one, it'll probably show up in the before's.
SCHMITT Okay, we want a rake.
CAPCOM Okay, copy that.
SCHMITT That's in bag 479.
CAPCOM Okay.
SCHMITT Gene let's rake - let's rake right out there.
CERNAN Right, let's get a bag on that one, and I'll get the gnomon out there.
SCHMITT Okay. Bob, as you might have seen from the camera up towards where we think Emory is, you get a pretty high concentration of boulders up there.
CAPCOM Okay, and I think that that's where we thought we were a little bit closer to Emory than you are.
SCHMITT Well, we thought about going on up there, although we're in a pretty good area here, too, from the standpoint of boulders.
CAPCOM Yeah.
SCHMITT Again I think - facing the Sun -
CAPCOM But first -
SCHMITT I think for the most part large and small all the fragments seem to be - seem to be filleted or even mantled by the dark material.
CERNAN Let me get out of your way.
SCHMITT I've got to clean my camera, I can't even see. What area are you going to rake?
CERNAN To your left of the - well ahead of the gnomon and to your left, there.
SCHMITT Okay, I got it.
CAPCOM Okay, Gene, we copy that that's a good observation, and I also gathered that most of the rocks look pretty much the same.
CERNAN That's what I said.
SCHMITT Yes, except a change in vesicularity.
CAPCOM Roger.
SCHMITT Except for size of vesicles where I described one as being a more hummocky vesicular type rock and the first time I noticed any of the dark minerals was when we took that one big flat chip off that boulder.
CAPCOM Okay, copy that.
SCHMITT I didn't look at it that close, to see what

APOLLO 17 MISSION COMMENTARY 12/11/72 23:12 CST 122:18 GET MC-480/4

SCHMITT it was.
CAPCOM Copy that guys.
CERNAN I'm going to get a pan Jack, while you're
doing that.
SCHMITT Okay.
CAPCOM Good idea, Gene.
CERNAN Man, there's some good targets for the 500
around here, we've got to get the Massif with the 500.
PAO The double core will be eliminated at this
stop.

END OF TAPE

PAO A core will be eliminated at this stop.
When it gets started back toward the -

CAPCOM And 17, again we'd like (interruption) -

SCHMITT And Bob, I'm really only penetrating -
I'm only penetrating about, at the most, about 3 centimeters
into this area with the rake. I've picked up a very good
sample of bla of boulders but most of them were - were in
that distance of the surface and projecting out of it.

CAPCOM Okay, I copy that.

SCHMITT You ready, Gene?

CERNAN A couple of more, Jack.

SCHMITT Okay, coming at you.

CERNAN Bob, the frame is complete. I'll give
you a frame count shortly.

CAPCOM Copy that, Geno.

SCHMITT There's two bags, I think.

CERNAN Two bags full.

CERNAN First bag is 457.

CAPCOM Copy that.

CERNAN 457.

SCHMITT Let me - Don't let me lose them. That's
enough. Give me a couple of small ones. Yep.

CERNAN Okay, okay.

SCHMITT That's good. That's good.

CERNAN Okay.

CERNAN Here, here, they are. Okay in bag 458 is the
rest of the rake sample. They're all fragments.

CAPCOM Copy that. Now we need the kilogram on the
soil.

CERNAN Yes sir.

SCHMITT Okay, Bob, all the fragments are completely
covered with - with the mantle in they are slightly - Oh,
maybe 20 percent vesicular. I just took a glance at them.
But for the most part they appear to be rounded and sub-rounded
fragments.

CERNAN Okay, let's get the kilogram.

CERNAN Okay.

SCHMITT Ahh, well, shoot. Start all over. Try
it again.

CERNAN 459 will get the kilogram, Bob.

CAPCOM Copy that.

SCHMITT Get some more.

CERNAN Okay, fill it up.

SCHMITT Can you close it?

CERNAN Yeah, yeah, I can close it.

SCHMITT That's a good kilogram.

SCHMITT Boy, I just can't even read my camera any more. I've got to learn how to control the dust. Yes, that's in.

CERNAN Okay, and you get the answer.

SCHMITT I tried to blow the dust off my (interruption) -

CERNAN Hey, we could get a - think it's going to be hard to get a double core here. We could try a single right there. Bob, we got time to get the core?

CAPCOM Negative. The core has been deleted. We'd like for you to get your second pan, Jack, and then we'll press on.

SCHMITT Okay.

SCHMITT I'll get it over here where where our two sample sites are in view.

CAPCOM Copy that.

SCHMITT Now I know why I felt that we were much too close to Trident than what I thought. We weren't really too close to Trident. Trident is way out here. That makes me feel better. A guy wouldn't know if he landed a hundred meters from a big set of crater like that. You know, on a landing site like this you ought to know exactly where you are. Anyway, I landed where I wanted to.

CERNAN Okay Bob, here's a reading for you.

CAPCOM Okay, ready for it.

CERNAN 670 012 901 670 012 901.

CAPCOM Okay, copy that, Gene-o.

CERNAN Okay, and no more charges to deploy going back. Right?

CAPCOM No, we will deploy charge number 7 on the way back.

CERNAN On the way back. Okay.

CAPCOM Roger. It will be deployed at the same location we originally planning on deploying it, which was in the checklist there.

CERNAN Okay. Very good, sir. We'll get at it.

SCHMITT Okay. I'm taking your camera.

CAPCOM Okay, and Jack, you got the pan or getting it?

SCHMITT Yes sir. And Bob, CR is on frame count 60.

CAPCOM Okay.

SCHMITT Which one. And F&B is on 95.

CAPCOM Copy, 95.

SCHMITT Okay, Gene, we need EP-7 Jack, the scooper back on. Okay, get the charge. I'll set the low-gain and we'll be - ready to do it.

SCHMITT Bob, my impression right now is that the dark mantle may just be a - a - well at least in here it's indistinguishable from a regolith that might be derived from these other rocks. It seems to be a little dark for that but that might be the answer.

CAPCOM Okay. We (interruption).

SCHMITT EP7.

CAPCOM We're also due on that again tomorrow and EP7 is the charge, right?

CERNAN Jack, I figured out if you - if you mount the rover at 90 degrees when you kick up your feet you'll miss the dust.

SCHMITT Let me hook you before I do that.

CERNAN Okay.

CERNAN Just put your feet 90 degrees to it.

SCHMITT Yeah.

SCHMITT Boy, you certainly ride high.

CERNAN Do I?

SCHMITT Yeah.

CERNAN I'm surprised the belt fits.

SCHMITT Yeah, it fits fine. Okay. I'm in. Okay.

CERNAN Opp - not to good - huh?

SCHMITT Yeah.

SCHMITT We're learning. I hope my bag was closed. Yours was. Did you get it?

CERNAN Yea - yeah. I, as a matter of fact, I did. I thought that.

CAPCOM Okay, we mark you underway.

CERNAN Hey, you know, you ought to put that sampler down.

SCHMITT Not yet - it's not the sampler - it's these bags with memories.

CERNAN This thing is to high for you. You're hitting it all the time.

CERNAN No, we're not on our way, Bob.

CAPCOM Okay.

CERNAN Okay. And you want the charge deployed at 320.7, huh?

CAPCOM Roger. It will be 0.6. We'll change that to 0.6 on EP7 but - and it will really be just where ever you cross 0.6 on the range.

CERNON Okay.

SCHMITT Well, it fit once.

CERNON Did you twist it, Jack? 180, that took out some of your - wait a minute - here. Which way. Well I can't see, your left hand is in the way now. Away from

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CERNAN you. Twist it away from you. 180 degrees.
You get it? Yeah, now the other 90. Okay, now try it.
Now, let me -

END OF TAPE

SCHMITT Let me see.
CERNAN You got it?
SCHMITT That should do it.
CERNAN Okay.
SCHMITT Okay.
CERNAN Here's your charge.
SCHMITT Yes, I think you're learning. That's
after the first EVA.
CERNAN Okay, Bob. We are rolling. Mark it.
CAPCOM Okay, copy that, Jack - Gene.
PAO EP7 is a half-pound charge.
CERNAN 6/10 of a kilometer.
SCHMITT Back.
CAPCOM Roger. Looking at a range of 0.6, guys.
SCHMITT You've got a block right ahead of you.
I got it.
CAPCOM Okay. And remember you'll be taking
photos coming back here, Jack, when you get a chance.
SCHMITT Yes, sir. Thank you. I got a few going
out, Bob, but they weren't too well spaced.
CAPCOM Okay. And I assume you've got the low
gain antenna alined.
SCHMITT Yes, sir, it's alined. Okay.
CERNAN That's got to be Trident, Jack, cause
that's too big for anything else.
SCHMITT Okay, Houston. The classic raindrop
pattern over this fine debris. I'd say that the surface
definitely is sorted. The fine regolithic material forming
one fraction and then the blocks another. The blocks are -
those blocks are greater than 2 centimeters in diameter,
in general, make up less than 10 percent of the surface.
But there are some big ones. And it's fairly uniformly dis-
tributed. They're blocks a meter in diameter.
CAPCOM Copy that.
CERNAN Hey, Jack, that big crater out there at
2 o'clock has probably got to be Sherlock. That's got to
be Sherlock over there.
SCHMITT Yeah. Probably.
CERNAN I think the only place I really identify
that we can go to is station 6.
SCHMITT Yeah, but you can't - we've got to get
a high advantage point here one of these days.
CERNAN Yeah. Well, I think we'll find Camelot
without any problem.
SCHMITT Yeah.
CERNAN Okay, watch. I'm going through it.
Okay. No problem.
SCHMITT I'd rather stradle than go through those -

SCHMITT Okay, Bob, here's another crater about the same size we sampled at the last station and it doesn't have as many blocks but it does have blocks and from this distance their vesicular texture and their light color shows up very well. I suspect they're the same general kind. There's a glass bottom crater.

CAPCOM Okay. Have you got a range and bearings, there, guys.

SCHMITT (garble)

CERNAN 341.8.

CAPCOM Copy that.

SCHMITT Did you take a picture of that?

CERNAN Yep.

SCHMITT You're pointing right at station 6 I think, Gene.

CERNAN I think you may be right. Or is that 4. I just want to get up here.

SCHMITT Not and one on the track but the one over there to the right of that.

CERNAN That's the one with the tracks - I've got mixed emotions which is 6.

SCHMITT That's probably - look over there to the left. You see that?

CERNAN Yes.

SCHMITT That's Trident.

SCHMITT Look at this thing. That looks like the same kind of rock except it doesn't have any vesicles. There's some white stuff in that rock. Just let me take a quick (garble) See that one right in front of it? Take a picture of it.

CERNAN You mean this one, here.

SCHMITT That's a big zap, isn't it?

CERNAN Take a picture of that.

SCHMITT Yeah, that big zap pit. That same rock with big zap pits. I got to change the - well, okay.

CERNAN Although, there are, I think, those are zap pits.

SCHMITT Kind of hard to say.

CERNAN Looks like a big chip on the rock.

SCHMITT They're white halos, it just has more of them.

CERNAN But it's a big one, it's about 1-1/2 or 2 inches across.

SCHMITT Yes.

CERNAN I tell you, I've got to go and get my (garble) and geometry squared away.

CAPCOM Okay, 17, how about range and bearing.

CERNAN Want to do this one.

CERNAN Okay. 341.7. Bob, we're moving at about 11 clicks right now.

CAPCOM Copy that. Beautiful. Remember the charge goes off at 0.6.

CERNAN Doesn't sound like. Okay.

SCHMITT Okay, we want to -

CERNAN Over there is the mantle - there's the white mantle. Look over there. Can you look to your left.

SCHMITT Yes, it does. Yes.

CERNAN That's the white mantle.

SCHMITT Lean around that way.

CERNAN Call it a slide or not, but that's the whity mantle. Whoo! That's my first real good picture of it. That is something.

SCHMITT Okay, I got some of that. Okay, how are we doing?

CERNAN I don't want to go in that crater, that's what I don't want to do. Okay. We're at .6, how about 339.2.

SCHMITT Okay. I got a couple of shots right in there.

CERNAN Okay. Coming right around to you.

SCHMITT Oh, that's good. Hold that heading. Whoa. That'll be good.

CERNAN Right here.

SCHMITT Yes, whoa. Okay. Let me get my - I got my locator. Okay, this one we want me to get a partial pan until something is identified.

CERNAN Okay. We'll do that. We've got to turn that way anyway.

SCHMITT Okay, pin 1, pull, phase. Pin 2, pull, phase, pin 3, mark it, pull phase.

CAPCOM Okay. I copy that as charge number 7.

SCHMITT That's affirm.

CAPCOM Okay. And we'd like a frame number when you get done there, Jack, after you get it on the ground.

SCHMITT Okay, I think we'll miss that. Okay.

CERNAN Okay. Bearing is 339.6.

SCHMITT Okay, start a pan around it, Gene.

CAPCOM Copy that, Gene.

SCHMITT Okay, now start slowly rolling.

CERNAN Okay, going to miss it?

SCHMITT Yes, by a lot.

CERNAN Okay through taking your pictures.

SCHMITT Yes, sir. Wheels cleared it by. It's got to be a lot low gain drop out?

CERNAN How much are my wheels missing by going around? A lot?

SCHMITT About a meter.

CERNAN Okay. We're on our way. The low gain is stowed again.

CERNAN Okay, we're heading on back to SEP.
CAPCOM Okay, and a frame count now, Jack.
SCHMITT Okay, pan - the pan was more or less
completed at 146.
CAPCOM Copy, 146 on auto.
SCHMITT Bob, you know, the more I look at this -
watch out for those babies there - this dark dust, if you
will, the more it doesn't seem like the kind of thing you'd
expect to have been derived from the underlying bedrock.
But I think you're going to have to play that game in the
lab right now.
CAPCOM Okay, I copy that. Can you -
SCHMITT We'll see how it works out later.
CAPCOM Roger.
SCHMITT It just seems dark and much too fine
grain. It doesn't have the impression that you're getting
the size distribution you'd expect to get by having all
these blocks around.
CAPCOM Okay - -
SCHMITT Definitely, I think, at least in my
mind, to population - size population - -
CERNAN Jack, that almost looks like bedrock
overexposed, see that?
SCHMITT Yeah, why don't you take a pass over
that way. Get through there?
CERNAN Yeah, I can get through there.
SCHMITT Do you know where you are.
CERNAN Yeah.
SCHMITT You in Trident.
CERNAN No, we're not in Trident. That's awful -
that's pretty steep down in there. I'd walk down there.
I'm not sure I want to drive down there yet.
SCHMITT I didn't mean down in there. I meant
right over there.
CERNAN Well, here's some right here.
SCHMITT Yeah.
CERNAN Take a picture of that?
CAPCOM And how about a range and bearing when
you stop.
CERNAN Okay. (garbled) 336.4.
CAPCOM 336.4. Roger.
CERNAN Bob, I get a distinct impression that -
Jack says it's going to be hard to tell whether this is
regolith composed from the rock field we see around but -
I get a distinct impression that you can see that there is
a dark mantle over on top of almost all the rocks. Except
that we have fresh glass perhaps in the bottom of some of
these small craters.

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CAPCOM Okay.

SCHMITT Everywhere else there is actually mantle
there I believe in and around some of the crevices - -

END OF TAPE

SCHMITT Crushed glass possibly in the bottom of these
small craters.
CAPCOM Okay. -
SCHMITT Everywhere else there is actually (garble)
I believe in and around some of the crevices and in the vesticles
and what have you.
CAPCOM Okay, I copy -
SCHMITT It's all material that could be -
It's material that could be knocked in there by the local impact.
CAPCOM Okay, but again, you find a lot of material
on top of the rocks.
CERNAN I think we lost them.
SCHMITT Not, a lot Bob. Not a lot. It's there
though.
CAPCOM Okay, copy that.
SCHMITT It's not nearly as covered with dust as they
get when - when you drop one. It's just a - really a salting or
a scattering of debris in those depressions on the rocks. -
CAPCOM Okay.
SCHMITT The projections of the rock are perfectly
clean.
CAPCOM Okay. I copy that.
CERNAN Yeah, but most of all the craters are - have
relatively (garble), except where the rocks are showing the
boulders on the side, within the craters are evident, are suddenly
covered over with this mantle. You don't see any good sharp
ridges on walls on some of these craters. Even the small ones.
CAPCOM Okay. Roger on that.
CERNAN Man, I tell you could lose the rear end of
this thing if you like.
SCHMITT I think you have lost a fender, I keep getting
rained on here.
CERNAN Oh, no. Look at that rooster - looks what's
ahead out there.
SCHMITT Yeah, that's probably it. It probably didn't
stay. I can see it in a shallow, shallow end.
CERNAN Yeah.
SCHMITT Oh, boy, that's going to be terrible. That is
really going to be bad.
CERNAN I didn't see it. We probably lost it. I
think I know when, because I just started to notice it.
SCHMITT Bob, I'm going to say what Gene said slightly
differently. There just aren't a lot of very sharp bright craters,
but there are some. All the craters seem to be pretty well, formed.
It isn't an extensive mantle. Matter of fact, for example, hasn't
filled the bay. We can deploy that thing now.
CERNAN Yeah, want to come in at a -
SCHMITT Hasn't filled the bottom of the craters.
CERNAN I'm going to come in at a heading here and
see if I can get on it for you, okay, drop me off there. Look
at that fender, look at the dust it produced. Look at the DAP LCRU.
SCHMITT Yeah, it's going to make -
CERNAN I don't know how to keep that thing on.
Make, it west. Okay, I'm rolling west right now. That looks

CERNAN That looks good (garbled). Boy I don't like losing that fender.

SCHMITT We're back in the set Bob, I'm starting to lay out my first track.

CAPCOM Roger. Copy that.

SCHMITT How's our time, Bob?

SPEAKER Okay.

CAPCOM Roger. You're about 5 minutes behind on the arrival time of the SEP. But we're - no real problem. And I assume that the range and bearing, when you got there was about zero.

SCHMITT Okay, good. Here let me leave my camera, let me read it. 252, 2.5 and 0. I'm resetting.

CAPCOM Okay, Copy that.

SCHMITT And the LMP frame count is 197 and it was still turning. (Garble) are 108 105 and Batteries are 100 and 120.

CAPCOM Okay. Copy 100 and 120.

SCHMITT Oh, wait a minute, I need my camera, don't I.

CERNAN Yes, sir.

CAPCOM I don't think it's much good to you with a 197 there, Jack.

SCHMITT No I don't. I don't need my camera.

CAPCOM Roger on that.

SCHMITT We're deploying it. No, you take the pictures. I don't need it.

SCHMITT Go ahead, play it out.

CERNAN Okay, here we go, up.

SCHMITT Hit it hard. Okay, Houston. The location is in about the least cratered area I could find, between the large crater or a large depression that's about, oh, ranges from maybe 50 to 150 meters behind the LM. That's maybe south, or east south east, and it's between that depression and another large depression, that is really a doublet with a blocky septum between them. That's to the northeast of the LM about 200 meters at the start of that second depression. I think we can get a nice layout, although, there'll be a general slope, I believe, towards the LM, of about a degree.

CAPCOM Okay, that's no real problem, Jack. No problem, Jack.

CERNAN Jack, am I about abeam of you?

SCHMITT Let's see. Yes.

CERNAN Okay, I'll turn in around this crater.

SCHMITT Hey, if you come right - (static)

SCHMITT That depression to the northeast, is at least a couple 100 meters in diameter and it's joined with one that's probably a comparable size just to the northwest of the first depression.

CAPCOM Okay, I copy that too, Jack.

CERNAN Okay. How's that look, Jack.

SCHMITT Great.

CERNAN Far, enough?

SCHMITT Yes. Yes come back.

CERNAN We head on to station 2 without that fender,
and are we going to be full of dust.
SCHMITT Okay, there's no special -
CERNAN I can park 1 in zero, but -
CERNAN Okay, Bob, I stopped back at the SEP.
CAPCOM Copy that, Gene.
CERNAN Dropped it. One came out, Jack.
SCHMITT Oh, yeah.
CERNAN This thing is a lot harder to turn than it
was in training.
CERNAN Oops, okay, that's the first two we've got to
deploy, can you bring your tongs.
SCHMITT Yeah.
CERNAN Bob, do you want me to dust this? I'll dust
back at the LM. We're going to deploy the SEP. God Bless.
CAPCOM They all say to dust, Geno.
CERNAN Okay, you're going to have to wait for me,
Jack.
SCHMITT Well, I've got antennas all over the place,
here.
CERNAN Yeah, as a matter of fact you do. Stand by
one second, I'll make it a quick one.
SCHMITT That's all right I can handle it, I think
here. But we're going to need your tongs to pick them up and not
get them all confused. Okay, where's the shadowgraph, there it is.
LM quadrant, that's the SEP quadrant. For sure we lost that fender.
CERNAN Okay, I'll deploy number 2 and 4.

END OF TAPE

SCHMITT Okay, I'll deploy number 2 and 4, and let's see that's number 1, this one must be number 2, it is.

CERNAN Okay, I'm almost there, Jack, let me running around in dust. Let me tell you, this dust isn't going to be fun tomorrow.

SCHMITT Okay, I won't bore you with details on why you see the antenna all over the ground, (laughter), but it has to do with 1/6 g.

CAPCOM Roger, Jack, understand you dropped a couple of the antenna rails.

SCHMITT You know Bob there very - more accurately I dropped 3 of them. Bob, you know this fine grained dust that we're in could be ground uppyroclastic, it might grind more easily than other things, and the blocks are just the - those blocks have been excavated from below that pyroclastic by the larger craters and some of the smaller ones in the area.

CERNAN MARK, remember the reading.

CAPCOM Okay, MARK that.

CAPCOM Roger, Jack, that would make a nice store wouldn't it.

SCHMITT Well you'd think glassy pyroclastic might turn into regolith a little bit faster than some of these other things, but we'll check that one out.

CAPCOM Okay.

CERNAN You want 2?

SCHMITT 2 and you get 1, right there.

CAPCOM And Jack, did you get the rails straightened out again?

SCHMITT Yeah, they're okay.

CAPCOM Thank you.

SCHMITT How could you stop a crew like this?

CAPCOM I don't know any way.

SCHMITT In all modesty I mean.

SCHMITT Okay, Geno, I'm on my way.

CERNAN Pull gently on that thing because I - it's awful easy to knock it over - I had that geophone module all over the place.

SCHMITT I can't tell whether I'm pulling gently or not.

CERNAN Any time you feel a tug, stop.

PAO This antenna's being deployed in tracks that have been made by the rover.

CAPCOM Careful guys.

SCHMITT At least, we're pulling at the base. I better watch what I'm backing into there's a lot of holes around here.

CERNAN Well, it happened Bob, I'm glad we Velcroed those pads, okay, I'm at the end Jack, are you having -

SCHMITT Hell, I -

CERNAN What happened was which we thought might happen it twisted on my -

SCHMITT I'll be there in just a second.
CERNAN Okay, I want F-11 at 250th and 74 feet. Well -
ah, ah, ah, ah, ah yes, you're pulling it over.
SCHMITT I'm not you are.
CERNAN No, I'm not, I've got all sorts of slack in
here.
SCHMITT Okay, it's okay.
CERNAN Are you out there?
SCHMITT Yes.
CERNAN Okay, let me back up a little and take the
slack out, and I would say off hand - oh boy what, you've got
a - that's about as close to a 1/6-g hexagonal, at least not
hexagonal, but straight lined.
CERNAN That's it Jack, here.
SCHMITT Stay, there, I'll take a picture.
CERNAN I thought you did.
SCHMITT No. Okay, I got it now.
CERNAN Hey if you try and stick that thing in, Jack,
you're going to fall over, just set it down and we'll stay away
from it.
SCHMITT Yes, you talked me into it.
CERNAN That was a good idea, but, that's a good
straight line.
SCHMITT (Singing the following lyrics: We were
strolling in the park one day -)
SCHMITT Well, we've had lots of good ideas in our
time.
CERNAN Oh, it pretty near makes me sick at losing
that fender, I can stand a lot of things, but I sure don't like
that.
SCHMITT Okay, I get number 4, which - where is it,
is that the one on the ground?
CERNAN It's probably the one on the ground. Got it?
CERNAN Is that the right one? Well, three, no this
is yours.
SCHMITT So take it, doesn't make any difference.
SCHMITT Okay, I'm deploying the - the LMP's deploying
rail 3 for your photography purposes.
CAPCOM Roger, copy that.
SCHMITT Oh - hey push that in.
CERNAN Roger.
SCHMITT Ah, ah, ah, -
CERNAN Serves you right?
CERNAN This doesn't push.
SCHMITT Okay, I'm ready to stroll.
CERNAN (Humming)
SCHMITT I found a brown rock that I'm going to bring
back.
CERNAN Please do.
SCHMITT I think it's the backside of a piece of glass,
but it's round.

CERNAN Well, I think I'm more or less on your track, it wiggled a little bit.

SCHMITT Oh we're - ooh, stop Geno.

CERNAN Okay, Jack wait a minute. That looks hexagonal to me. Got your picture?

SCHMITT Will have in a sec. Wait a minute, everytime I do something I change the setting, okay, I got it.

SCHMITT I straightened the line out a little bit better, after I took the picture, a few kinks in it. Now where's my brown rock. I saw it when I was driving with the rover, I knew I'd be able to come back here, because of the tracks. Looks like an old piece of bread.

CAPCOM Is that the one that came out of that?

CERNAN What the heck is that, huh? Oh there's a piece of - well it's a piece of glass all right, crumpled, part of it crumpled but, I got to get that in a bag, oh man is that a nice piece of glass, just laying out here all by itself. Jack, you got a bag handy, while I take my pan, I can't reach a bag, I got this sample in the wrong hand.

SCHMITT I don't have a bag.

CERNAN You don't have - well take one off of mine and give it to me, I'll take it back to the rover.

SCHMITT Watch, you've got a wire under your foot.

CERNAN Bag number 460.

CAPCOM Copy that, bag number 460 ground glass.

SCHMITT I have one out on the north course -

CAPCOM Sorry about that -

SCHMITT - I have one out on the north course of the
of -

END OF TAPE

CAPCOM Sorry about that -
SCHMITT About half way out on the north course
of the steps.
CERNAN It's brown vesicular glass.
SCHMITT Sort of a yellow-brown, as a matter of
fact.
SCHMITT Okay, it says -
SCHMITT Locator forward to LM - I thought I took
a pan here. The LM wasn't - okay.
CAPCOM Yes, the locator is really all you need,
but a partial pan of the area would be appreciated.
SCHMITT Yes, I'm here, I'm going to get a partial
pan, Bob.
CAPCOM Okay.
CERNAN The only reason I'm doing it is I know
it'll be appreciated.
CERNAN Okay, take locator, photo LM, I got it.
and Bob, I'm on - if I can get where I can read it - on about
71 on my frame count, and let me give you - boy, we got to
stay out of this area, Jack. We'll pick up these cables,
just as sure as the devil. Oh, that fender. Boo - boo.
Hey, Houston, will you look at your solar panel?
CAPCOM Roger, we see the solar panel.
CERNAN You notice how they flop up?
CAPCOM We noticed that, too.
CERNAN (garble)
CERNAN Okay, 670010101, that's 670010101.
CAPCOM Okay, I got that one Geno.
CERNAN The wires have memory. Okay.
SCHMITT I need gray tape.
CERNAN Let me put this in your bag and I'll get
the gray tape.
SCHMITT Okay.
CERNAN We didn't break any records collecting
samples, but at least we got an ALSEP deployed. That gray
tape, Jack, is not going to stick on anything with dust.
SCHMITT I know, that's what I was thinking.
CERNAN Cause I just been there with that fender.
CERNAN Well, let's try it.
SCHMITT You have a -
CERNAN I don't need the fender, I can cut it
without it, cut.
SCHMITT Don't back up in that wire -
CERNAN Just like the cover of a -
SCHMITT Got it? Add that.
SCHMITT Yes, I guess.
SCHMITT Okay.
CERNAN Get this one?
SCHMITT Yes.

CERNAN Keep from falling over. You want to
take those solar panels off?
SCHMITT Let me hold on to you.
CERNAN You better lean on me.
CERNAN If not, let's take them off and hold
them.
SCHMITT No, I think it's going to be easier
this way.
CERNAN Okay, try it. I don't think they're
going to be much problem the way they are anyway.
SCHMITT Can you hold it?
CERNAN Yes, go ahead and lean if you want.
SCHMITT I don't know how long it will stay.
CERNAN No, I don't know. Here's one.
SCHMITT Give me another one.
CAPCOM It's only got to stay for a few days, guys.
SCHMITT (garble) pull the whole thing over.
CERNAN This will be a - this will be a test
if it holds till we see it again.
CERNAN Don't knock the whole thing over.
SCHMITT See, I'm leaning on you.
CERNAN Okay, lean.
SCHMITT The piece of tape is so dusty - it may
not work.
CERNAN Try it somewhere.
CERNAN Are you happy with the alinement?
SCHMITT I was - is the gnomon the the zero mark?
CERNAN Gnomon is right up to zero mark.
SCHMITT That's where it's supposed to be.
CAPCOM (garble)
CERNAN Okay, and the level bubble is just
touching the - the inner circle.
CAPCOM Okay, copy that. And we have the
transmitter switch in standby, right?
CERNAN There's a little bulge on the transmit-
ter, is that -
CAPCOM It will be -
CERNAN Now, you're doing all right - there's are
okay.
SCHMITT Forget those.
CERNAN Jack, looking where the LM is, if I
were you, I'd just walk down.
SCHMITT Come here, Gene.
CERNAN What do you need?
SCHMITT I need some support.
CERNAN Ah, that's the key, everything on
this SEP is coming off harder than it did when we deployed
it at the Cape.

SCHMITT Are you there? It may not be harder, but it listed. Okay, now, I got to reorient it.

CERNAN Now, let me see? You're standby - now let me look at it - the gnomon's right at zero.

SCHMITT Okay, right at zero.

CERNAN It's just the same - it settled back just the same - zero gnomon and inner circle.

CAPCOM Okay, beautiful.

SCHMITT Let's go.

CERNAN You want to walk back or ride? Let's see, it's up to you but -

SCHMITT Oh, I'll walk back.

CERNAN Man, I hate this dust. I got to make a new fender tonight. Well, let's see, I guess I'm supposed to -

CAPCOM Hey, Geno, I presume that the fender that came off is the fender that came off before, right?

CERNAN Yes, same one - my tape didn't hold - it was too dusty.

CAPCOM All right.

CERNAN Okay.

SCHMITT Hey, watch out for this antenna line I found out here.

CERNAN Yes. Okay, travel to LM. Okay, Bob, I'm not going to change anything right now except get in and travel. All right?

CAPCOM That's affirm. Time to go home.

CERNAN How's our time, Bob?

CAPCOM You'll have a nominal closeout time if you get back. We're right about on the time that we were figuring on for you guys to get back on. Right now you are at 6 hours and 11 minutes into the EVA.

CERNAN Boy, there's a big boulder.

SCHMITT Yes, I discovered something - I learned a lot today, let me tell you.

CERNAN Okay, we're going to lose TV cause the high gain is going to be out of whack here in a minute.

SCHMITT Hey, I got a football size rock of this vesicular, coarsely vesicular gabbro, Bob. It's off a large - 3 or 4 meter buried boulder from the LM about 30 meters.

SCHMITT Do you read, Bob?

CAPCOM Roger, Jack. Read you loud and clear on that one.

SCHMITT Okay, it'll be in the big bag.

CAPCOM Okay -

SCHMITT Undocumented, it's about - it's roughly tabular - 15 by 25 centimeters and about 5 to 7 centimeters thick. One face is very flat, looks like it was off of a parting plane, which were in that rock.

CAPCOM Okay, and if it'll fit in the SRC with all those other samples you might put it there because the SRC's going to be kind of empty

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CERNAN -- Any new parking angles for your batteries or anything?

CAPCOM No, it will be a heading of 013, which is hardly a change at all from the 012 in the checklist.

CERNAN Okay, I'll buy that.

CAPCOM Jack, did you copy that?

END OF TAPE

CAPCOM Jack, did you copy my comments about putting
that thing in the SRC perhaps?
SCHMITT Well, it was pretty big, it's in the big bag
now, we can do that.
CAPCOM Well, I guess the other samples a small
ones and put those soils in the SRC first.
SCHMITT Okay.
CERNAN Are you through?
SCHMITT No, I'm going right, right about here, now
I'm done.
CERNAN Okay.
SCHMITT Right there.
CERNAN Okay, Bob 086, .5, .1, 108 oh oh, 102.
CERNAN Stand by one.
CERNAN Okay.
SCHMITT AMP hours are at 108, 102, volts are 74 and 75,
batteries are 108 and 123, motors are all off scale low,
all 4 of them.
CAPCOM Roger, Gene, understand 108, 102 on the
amp hours, over.
CERNAN That's affirm, 108 and 102.
CAPCOM Okay, copy that.
CERNAN I can't read this thing, cause it's so
full of dust, I've got to get off and dust it.
SCHMITT Okay, the SEP receiver temp is 45, 45.
CAPCOM Copy 45, beautiful.
SCHMITT You know, I think they left some Velcro off
of this thing, Gene. There's no Velcro holding those flaps down.
CERNAN Isn't there?
SCHMITT Nope. Okay.
CERNAN I've got to get the brush and dust that
thing - a minute or 2.
SCHMITT Okay, let me get the high gain.
CERNAN I feel like taking some core tubes tomorrow.
CAPCOM (garble) you've got a couple left over, don't
you?
CERNAN Bob you got -
SCHMITT Yep.
CERNAN Bob, you got the high gain?
CAPCOM Okay, thank you.
CERNAN Is that - is that my bag, Jack you got?
SCHMITT Yes.
CERNAN That's pretty good.
CAPCOM Okay, let's put all the stuff in that bag,
Jack, both the stuff that's in yours and the stuff that's in
Gene's.
SCHMITT Okay.
SCHMITT Samples - 2 samples from under the LMPs seat,
get these under the seat, clean you up here while I'm at it.
CERNAN Oh man I tell you, it's going to take us

CERNAN half - a month of Sundays to dust, look at
 that fender, that's terrible.
 SCHMITT Okay, you want to get my bag off.
 CERNAN Yep. If you're ready.
 SCHMITT Yep.
 CERNAN I've got to put your soil sample in the SRC,
 in your bag and we'll save this one, I guess.
 CERNAN Wait a minute, let me clean you up.
 SCHMITT Okay.
 CERNAN Did you get me cleaned up.
 SCHMITT Yes, you lost your -
 SCHMITT - Wait a minute - your strap over here.
 CERNAN Wait a minute, get all the dirt. Okay, you're
 getting my hook back up over here (garble).
 SCHMITT Okay - you hooked, and I'm not sure I closed
 your -
 CERNAN The other one -
 SCHMITT You hooked something and I'm not sure I closed
 your -
 SCHMITT The other one - take a look at it, yep it's
 all closed. Okay, you're good.
 SCHMITT There you go.
 CERNAN Okay, you're still in which bag, the -
 SCHMITT Putting them in the bag that goes into the
 SRC -
 CERNAN That's SRC SCB-1.
 CAPCOM Roger.
 CERNAN Okay, let's see auto flow normal to PLSS,
 (garble) dispenser tools, okay, as soon as you get that, I'll
 take SCB-1 from you, and I'll close this (garble) 1.
 CAPCOM Okay, and I gather you didn't have any rover
 sample today did you Jack?
 CERNAN Get my tongs here.
 SCHMITT No, I had one sample bag in my pocket that
 has a rock in it.
 CAPCOM We'll have to take that out when we get in
 the rover.
 SCHMITT Okay. Gene, where's that - you want to put
 that little rock?
 CERNAN Yeah, is it there?
 SCHMITT Well what did you do with it?
 CERNAN It was up more on my side.
 SCHMITT Your side?
 CERNAN There it is let me get it.
 SCHMITT We can put that in one of the core tube
 slots here.
 CERNAN Boy that one fender just, in an order of magni-
 tude, is more of a dust problem. Here, can you reach it.
 SCHMITT Okay the rock that Gene picked up - early
 right at the start is in a core tube slot in the SRC-1.

CAPCOM Okay, I copy that.
SCHMITT Okay, Gene, you want this one?
CERNAN Yes, I want the full one.
SCHMITT Yeah.
SCHMITT Latched.
CERNAN Okay.
SCHMITT Bob, that's almost full of samples, and I think that big rock would be - probably wouldn't fit in there.
CAPCOM Okay, then we'll put that in the big bag.
SCHMITT It's in the big bag.
CAPCOM Good enough. And I gather there's no rover samples today, right?
CERNAN Okay -
SCHMITT No rover samples, sorry.
SCHMITT mm (sound of exertion).
CERNAN Okay, the seal is clear, like I promised I'd make it, coming over the top. Bob, the seal is clear.
CAPCOM Beautiful.
CERNAN I don't know if it's beautiful, but it's clear.
CAPCOM It's clearly beautiful.
CERNAN Okay, okay, that big Mamu is locked. I got a lot of oxygen, I still got 22 percent.
CERNAN I bet you our feed water may be getting a little low.
SCHMITT I'm going to leave this right here, until I take it up to you. Okay, close SRC and verify good seal, place at 1 B. Okay LRV circuit breakers: LRV LCRU power OFF. Let me get at that dusting first.
SCHMITT Give a yell, when you need a spell there.
CERNAN What, dusting?
SCHMITT Yeah.
CERNAN I need a fender, that's what I need; figure out something we can make a fender with.
SCHMITT How about one of the others that's not as critical?
CERNAN Yeah, but we'd never take one of those off, you know getting it - I had one to put on and it didn't stay, which is what I figured.
SCHMITT I thought you said it was broken, though?
CERNAN Well, it was. But these aren't supposed to come off either, unless you break them.
CERNAN I broke that one; my hammer got caught underneath it, it wasn't the fender's fault. Okay, the core tube is packed.
SCHMITT Everytime I read containment bag it fools me, I can't figure out what it is.
CERNAN Everytime what?
SCHMITT I read containment bag.
CERNAN (laughter) You've been thinking of the other kind too long, you've been living in the command module too long.

END OF TAPE

SCHMITT That's a pretty good days work out you know. You know I don't think we need an exercise period. We can get back in there. I don't think we have to apologize to anybody. I'm sorry we didn't get up in station 1. One of the main reasons is, I think, we could have to our navigation bearings a little bit better.

CERNAN Well, I'll tell you that new ALSEP had more to it than met the eye.

SCHMITT This hole out here - you know, this is just such an easy thing to find out and identify yourself on the land in. But I tell you all of a sudden there is so many local hole that I can't think big enough.

CERNAN Does that sound familiar? Okay, Jack rest of my dusting until - Am I in your way?

SCHMITT Yeah, I'd like to get over there to get the - this last battery cover. I can. That's good enough. I can get over there now. I want to make sure these things stay clean because I don't want to walk.

CERNAN I agree.

SCHMITT Okay, Bob, containing bags from two cameras.

CERNAN Are stowed in the ETB.

CAPCOM Copy that and don't forget the scissors guys.

SCHMITT Don't worry I've got them right here.

CAPCOM Beautiful - don't want to go hungry.

SCHMITT It's a good call Bob. That's right.

CAPCOM And Jack, give me your consideration or Gene on that question of bringing back the big bag into the cabin. The people down here are saying they want to bring it in and then we'd end up bringing it back out in the second EVA. What do you guys think of that?

CERNAN That's all right, we can do that.

SCHMITT Yeah, we can do that - I guess just cause they're rocks in there, huh? I'd like to do that - look at that rock with the handle in it.

CAPCOM So then we'd be taking it back out in the second EVA if you guys are agreeable to that.

CERNAN Yeah, we'll do that, Bob.

CAPCOM Ah Jack do you think it'll go on the STB?

SCHMITT Say again.

CAPCOM Do you think it'll go on the STB number 2?

SCHMITT What would - the rock?

CAPCOM Yeah, that's right.

SCHMITT Well, it'll go in there it's not that big.

CAPCOM Okay why don't you put it in STB - why don't you put it in STB 2 and bring that in instead. Leave SRB out and we'll just leave STB 2 in forever.

CERNAN Okay. Okay, verify SRC plus Z pad. What are those things going over? What is that, Jack. Hey, something just hit here. What blew? Hey what is that?

SCHMITT Your antenna - your - it's that styrafoam off the high gain antenna backing.

CERNAN On the LM?

SCHMITT No the one you deployed. They are over high gain antenna.

CERNAN My God, it blew up. I thought we'd been hit by a - by a - look at that stuff just keeps flying over the top of our heads. I thought we were the closest witnesses to the lunar meteor impact. However, is that the same glass I picked up?

CAPCOM Oh, I don't know, John says it blew up on his mission too guys.

CERNAN Isn't that what you thought it was?

SCHMITT I thought you were kidding.

CERNAN No, I've never seen that before.

SCHMITT Oh, I'm sorry I thought that was -

CERNAN No - you just - you just - when you saw that stuff coming I didn't see that at all. Holy Smoly.

CAPCOM Roger, 17 and John says that it blew up on his mission as well.

CERNAN Okay, Bob, I guess I'm going to take the TV away from you.

CAPCOM Okay, and Gene one thing we'd like before you guys leave the ----- rove -

SPEAKER GARBLE

CAPCOM One thing we'd like before you guys leave the Rover is a fairly good description of what happened to the rear fender when it came off. Is the damage primarily to the piece that you've lost or the rails on the piece that's remaining fairly bad?

CERNAN Okay. Mag the Romeo. Well a piece of the rail on the aft inboard side here - the rail isn't missing - it's just a piece of the flange - the rail that fits against the fender - but that doesn't hold any part of the fender on. I don't remember what I saw on the fender - the rails look pretty good, Bob. And I had one of them completely on and I just couldn't get the other one on. If I had known what that dust was I would have tried an awful lot harder.

CAPCOM Okay, do you have any feel on the

CERNAN I heard John telling me.

CAPCOM Do you have any feeling that you could get away with putting a front fender on?

CERNAN Well, I have done it before - but it's not easy.

CAPCOM Okay, as far as you can tell so that we can look at it over night - the rear fender - the part that's remaining looks in fairly good shape, right?

CERNAN We're taking a good look at it. Yeah, the part you need I think to hold that fender on -

SCHMITT Let's see - we better take those dust brushes up there.

CERNAN Yeah, there's enough here to hold the fender on, Bob.

CAPCOM Okay, we'll take a look at it while you're sleeping.

CERNAN Okay, let me get some breaker here. Delta P breakers Alfa, Bravo, Charlie, Delta.

SCHMITT Bob, while you were talking I got all the mags Romeo Alfa Golf Charlie.

CAPCOM Hotel. Hotel.

SCHMITT That's on a magazine. That's on our camera.

CAPCOM Okay. Got you on that one - you're right.

SCHMITT Is it not?

CAPCOM You're right, my fault - you've got the maps too.

SCHMITT I need those maps, Gene, could you give me the maps.

CERNAN I don't know. Pretty good clip - GARBLE aren't they?

SCHMITT Getting hot.

PAO That'll end the television until EVA 2 tomorrow.

CERNAN That keeps falling out of your clip, in case your interested.

SCHMITT I keep knocking it out.

CERNAN Put it down, here.

SCHMITT Okay, I've got the maps the 500 mag, yeah, and the three - two cameras.

CAPCOM Okay, we'll have to get the contamination bags too there.

SCHMITT Say that again Bob.

CAPCOM All right. We've got the contamination bags to get two out of the MESA.

SCHMITT I've got them.

CAPCOM Okay copy that.

SCHMITT I mentioned that earlier.

CAPCOM Sorry about that.

SCHMITT They're in there.

CAPCOM Okay, do you know when you're brushing the LCRU we'd like the blanket left at 100 percent rather than 65 percent - we'd like them all left open and a little warm also.

CERNAN Okay, Bob, I've already dusted everything. And it all looks pretty good. The breakers are open the crew power is off. Where do you want the TV camera? Do you want it tilted down and aft?

CAPCOM Roger, down and away from the Sun like we talked about. I think that's what you mean by aft.

CERNAN That's what I thought. Okay. It's down - yeah it's dead.

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CAPCOM Okay, can you confirm that that's 100 percent
on the LCRU blanket rather than 65 percent as per the checklist?

CERNAN Yes sir, I sure can.

CERNAN Okay, I'm opening all the battery covers -
the batteries are not dirty. I've been dusting the covers every
stop.

CAPCOM Okay, good.

SCHMITT Are you through with the SRC?

CERNAN Yeah, I just left it there.

SCHMITT I've got to get to the table.

CERNAN Okay.

END OF TAPE

SCHMITT Okay, I'm opening all the battery covers. The bateries are not dirty. I've been dusting the covers every stop.

CAPCOM Okay, good.

CERNAN Are you through with the - Are you through with the SRC?

SCHMITT Yeah, I just left it there.

CERNAN I've got to get to the table.

SCHMITT Okay.

PAO Ron Evans in America, began an 8 hour rest period about, 10 minutes ago.

SCHMITT Bob, you got - you got the left hand forward reflector on the batteries, is about 10 percent in shade. The others are in the sun. Is that what you want?

CAPCOM Stand by. Okay, that sounds right they say.

CERNAN Okay, the crew has been dusted, everything is dusted. Our blankets are open 100 percent. If not, I'll recheck. Battery covers are open, the crew blanket is open 100 percent samples off. Got them all off, Jack?

SCHMITT Yes.

CERNAN Anything else, let me look around. I got to get the data one more time.

CERNAN Samples off, let's look under here. There's nothing under here. This bag is empty. Those are sample bags. Okay, we did not bring up the LM ECS canisters, that correct?

CAPCOM That's correct, 17.

SCHMITT Okay.

CAPCOM And Jack, confirm you have the scissors in the ETB. Roger.

CERNAN Just a second. (Laughter), yes sir. Thank you again. Okay, fighting the old blanket. Okay, that pin's green, that pin's green, both pins are green.

CAPCOM Copy that.

CERNAN Boy, I'm dirty. Okay. Okay, I'll take the stuff up SCB 2 we don't have. Oh, wait a minute, what did we decide to do with -

CAPCOM SCB-2 for the big rock there, Jack.

SCHMITT Put that big rock in the - Oh, okay.

CERNAN How's our time, Bob?

CAPCOM There's no problem on time.

SCHMITT Move in on those mirrors there.

SCHMITT Could I sneak in and get a bag.

CERNAN Yep.

PAO We're at 6 hours, 36 minutes in this EVA.

SCHMITT See you later, Rover.

CERNAN Okay, the SEP blankets are open, it is dusted, okay, and I verify that the DSEA is off, and the power's off.

CAPCOM Copy that, Gene, thank you.

CERNAN Okay, you want the TGE, right side of the Mesa, but in the shade. Okay.

CAPCOM That's affirm.

CERNAN Boy, did it get covered with dust, too.

SCHMITT Bob, no trouble with the TGE in the TV,
huh?

CAPCOM Not so as we can tell, we'll get another
reading here, when we see it on the ground here.

SCHMITT Hey, Jack, if I set this here we -

CERNAN What. I just want to set it here so I don't
knock it over.

CERNAN What's that?

SCHMITT The TGE, right here your left foot is.

CERNAN Oh, yeah.

SCHMITT I'm afraid I'll knock it over if I
set it any where else.

CERNAN Stand by I've got a lot of stuff here.

SCHMITT Okay.

CERNAN Be sure to volunteer to take the big
bag in.

SCHMITT Why, you having trouble getting that
thing in.

CERNAN Ah, it's just -

SCHMITT Yes, I'm having trouble.

CERNAN Well, here let me help you.

SCHMITT Hold this big bag for me. Just don't
back up if you can help it. Hole the bag. This big one,
this one. Now the other one, the other one, don't.

CERNAN I can't too, I got it. That's a big rock,
I wonder if it will fit here longways.

SCHMITT Okay, there should be another one in
there, isn't it.

CERNAN I feel it. Squeeze it, hit it with the box,
see if there's any in there.

SCHMITT I'll squeeze it.

CERNAN Okay.

PAO America has just gone behind the Moon.

CERNAN (garble) out here pick it up, we'll get
it up.

SCHMITT Hold the top. Shake it.

CERNAN Well, I thought there was one in there.

SCHMITT I don't think there's anything in there.

CERNAN I thought I put one in there.

SCHMITT Okay.

CERNAN Well, I guess not.

SCHMITT Go ahead.

CERNAN It's gotten out. Got away. Okay, I'm
going to leave the TGE right here. I'll put the TGE right
side of MESA. Okay, I might give them a gravimeter reading
believe it or not. Boy I'll tell you, the only thing bad about
putting this thing on the ground, it's like everything else,
you have to bend over to get at it. And you need support to
get back up.

SCHMITT Okay, MARK gravimeter.

CAPCOM MARK, you're MARK.

SCHMITT It keeps flashing, Bob.
 CAPCOM Thank you.
 SPEAKER Spheos.
 CERNAN Okay, I'm suppose to take this in the
 core stem bag up there.
 SCHMITT Okay, I'll get it for you.
 CERNAN Can, you get the core stem bag, Jack?
 SCHMITT Yeah, I'll get it for you.
 SCHMITT Okay, you got in the core stem bag.
 CERNAN Yep, let me give it one sap with the
 brush.
 SCHMITT Okay.
 CERNAN I didn't mean to drop that, but I did.
 SCHMITT Yeah, we gotta - we gotta keep from
 dropping from everything, I'll tell you the big lesson.
 CERNAN Yeah, I guess, the big lession is, that
 it's going to get dropped, if your hands get tired.
 SCHMITT Yeah.
 CERNAN Here it comes now. Got it.
 SCHMITT Yeah.
 CERNAN Okay, let's see the reading, we got a charge
 in it and (garble) down here.
 SCHMITT I'll make a check of what you've got
 up there. What have you got up there so far?
 CERNAN It's the SRC2 and the core stem.
 SCHMITT Okay, SRC2 and the core stem. Okay.
 Where's EVA pallet?
 CERNAN It's on the MESA table.
 SCHMITT That's good, that's great. Where ETB,
 that's ready to go up.
 CERNAN Yep.
 SCHMITT Okay, core stem bag, SRC 2, SRC1 is in
 the - (garble) SRC 1 and (garble) in there. The big bag is
 not required.
 CERNAN Good.
 SCHMITT Okay, any more room up there, if not
 why don't why don't -
 CERNAN No I don't think
 SCHMITT Why don't I dust you here.
 CERNAN Okay, this rock, you laid it on here.
 SCHMITT Watch your foot, you're caught in that
 thing.
 CERNAN Yeah.
 SCHMITT Pick up your right foot.
 CERNAN Jack, you're just going to have to get
 up on that ladder somewhere so you don't get the dust all
 over this thing.
 SCHMITT Well, I've got to dust you too.
 CERNAN Well, okay, go ahead and get met.
 SCHMITT Yeah, where's your brush.
 CERNAN Right on the hook.
 SCHMITT Right, see what I can do. Kick most of
 it off, I hope.

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CERNAN You have to go anywhere else now?
SCHMITT Just right around here, no place but
right around here. And that's it - like a super endless
task.

END OF TAPE

CERNAN Get the top of that thing if you can.
SCHMITT Oop - oop - it landed on a slope.
CERNAN Yep.
SCHMITT Okay, that's good.
CERNAN But the arms.
SCHMITT Hold them up and shake them too, in case
there's anything down in them.
CERNAN Let me just - yeah.
SCHMITT Let me get forward so you can get at me.
Okay, how's that? I admit it's going to be bad but we
want to get as much off as we can.
CERNAN How about this one?
SCHMITT (garble) come around on the other side,
if you want.
CERNAN Yeah, I can hold on better that way.
SCHMITT Just take some of it off.
CERNAN Yep.
SCHMITT I'll get up on that ladder and you get
a whack at my legs best you can. And I'll kick my boots
clean.
CERNAN That fender is really going to be a nuisance.
SCHMITT (garble) gone.
CERNAN I'm going to have to get you to bend over
too so I - not now.
SCHMITT Know that there's a lot on me.
CERNAN OPS.
CERNAN I just as well store my antenna while you're
up there.
SCHMITT Okay.
CERNAN That's really putting the finishing touches
on the old arms, isn't it?
SCHMITT Yes.
CERNAN How'd you get so dirty?
SCHMITT Huh, just wait till I show you a picture
I took of you.
CERNAN Didn't.
SCHMITT Okay, Gene. Most of what's left is up on
your - get your antenna. Oh, you're going to go up there first.
CERNAN You want -
SCHMITT Okay.
CERNAN I don't know how you do that.
SCHMITT Just - just really strain.
CERNAN You got it.
SCHMITT Beautiful.
CAPCOM Okay, Gene, you copy both antennas up.
CERNAN Better get my leg up, you know -

CERNAN No. No sir, Bob. I'm still getting
dusted. We're trying to go over this thing pretty thoroughly.
CAPCOM Okay.
SCHMITT Pocket is fairly full of dirt. That
brush does pretty good, though.
SCHMITT Want me to move, or anything now. Okay.
SCHMITT I'm just a mess.
CERNAN Just when I do this, I get dirtier.
SCHMITT Yeah.
CERNAN Once I get you this far I'm just going
to shove you right up that ladder and not let you get in
the dust.
SCHMITT Uuh.
CERNAN Okay.
SCHMITT No, you're not okay. You're awfully
dusty.
SCHMITT But I don't know that I can do much more.
CERNAN Okay.
SCHMITT That looks pretty good. I'll walk -
hit your boots real hard when you come up.
CERNAN Yeah.
CERNAN Okay.
CERNAN I've just got to stay on my feet here
for awhile.
SCHMITT Want me to -
CERNAN Stand in a pan - yeah.
SCHMITT Stay there and I'll get your back and
your PLSS while I'm at it. You're stuck with - stoop down
if you can. Stand on the bottom of the pit - there you go.
CERNAN How's the old ALSEP, Bob?
CAPCOM It's looking great, guys.
CERNAN Don't forget, Jack, you must store my
antenna, yet.
SCHMITT Right.
SCHMITT Okay, while I'm up here let me get the
top of your OPS and I'll store your antenna at the same
time. I - You're going to have to get further down. I
can't reach it.
CERNAN Okay.
CERNAN That's good.
CERNAN I feel like praying.
CERNAN I guess I am.
CERNAN Now, maybe I can get some dust off you.
CERNAN Just stay there.
CERNAN And it will be stowed in half of a jiff.

CERNAN Oh, my sneakers will never have the dexterity that they once had.

CERNAN Okay.

CERNAN Make sure you don't have anything hanging on your (garble).

CERNAN Do you can stand to let me work on your arms?

CERNAN (garble) on that so I can get the other one. No, maybe I won't need it. Maybe I'll get it - hold onto the ladder some, it'll give me stability too. Okay. I'll get the bags out from the arm from the other side. Let me get your - your waist turned on.

CERNAN Getting there.

CERNAN Shoulder.

CERNAN Here, let me try your left arm.

SCHMITT Okay.

CERNAN Okay.

SCHMITT Let me go up the steps.

CERNAN Okay, there.

CERNAN Oh boy, Hallelujah.

CERNAN Keep to that.

CERNAN Let's get the lot off, Jack. Keep doing that. Keep doing that.

CERNAN Boy, that gets it off your shoes.

SCHMITT Okay.

SCHMITT Okay. Put this foot out here.

CERNAN We're still at it, Bob.

CAPCOM Yeah. I've seen it go a lot faster down there in the clean room at the Cape.

CERNAN Boy, you bet-cha and I know why we didn't do it, it was just as tough down there as it is here.

SCHMITT Okay.

CERNAN No, not yet, I want to get - my other leg. And then I want you to lean over and get my antenna.

SCHMITT (garble) I need to brush off the top too. Stow your antenna first.

CERNAN Okay, babe, that's about all I can do for you.

END OF TAPE

CERNAN You brushed off the top two. Stow your antenna first. Okay, babe. That's about all I can do for you.

SCHMITT Okay, get my antenna.

CERNAN I took off you and got more on me.

SCHMITT Can you reach it from there?

CERNAN Yeah I think I can. Oh, whew -

SCHMITT I have 7 hours from the time I looked at my watch. It's got to be pretty close.

CAPCOM You guys have got 6 hours and 53 minutes and 40 seconds.

SCHMITT Okay, Gene, you stowed (garble).

SCHMITT Okay do your brush.

CERNAN Okay here it is.

CERNAN Okay that's the best I can do.

SCHMITT Okay, let me get to the top of this pocket.

CERNAN Okay. Go on up stay clean.

SCHMITT Well - you've got - let's see GARBLE you've got to bring stuff up I guess, huh?

CERNAN Yeah.

CERNAN Okay, Bob, I need the EVA pallet.

SCHMITT Okay, I've give you that and then I'll get to work. I've got some work I've got to do for Bob. Ah, okay, everything on EVA pallet.

CERNAN Yeah, just hand it to me and I'll start unstowing it up there.

SCHMITT Okay, man, I forgot I had my visor up. Zowie. Get back in the shade.

CERNAN Got it?

SCHMITT Yeah.

SCHMITT Okay. Okay, Bob, I'll try to give them to you one at a time. LMP got the EVA pallet. Let me give you a mesa reading and I'll tell you - read it and I'll tell you the blanket.

CAPCOM Okay.

CERNAN Okay, the reading is 000 133 201 and I can only assume that one of us hit it. I think I've got time to give you another one.

CAPCOM Okay, quickly.

CERNAN Bill that's the way it'll be because it's already punched. Mark it.

CAPCOM Copy that.

CERNAN Okay, I'm tidying up the mesa blanket. I'm pretty tidy.

SCHMITT I did that.

CERNAN Okay, mate the blankets are tidy. Okay open TGE - I'll do that - brush the ladder hook - final transfer Jack. I'm going to - okay, I'll tell you what I'm going to do. You've got (garble) the inventory here - you got the pallet - ETB is here and you got the core strip bag. SR - SCB-2 - it's SRCl here; big bag is not required.

CERNAN Bob, I think we got everything. The two things on the surface yet are the ETB and the SRC and me.

CAPCOM Okay, we copy that, but of course -

CERNAN Get down a little bit more and you've got another 2 or 3 inches.

SCHMITT I can't get any lower, Willie, me buttons are in the way.

CERNAN Okay, keep going. If your pocket's over the sill - there you go. There you are - you're in. Kick off your feet if you can - kick them right there. That's good. That got a lot off. Okay, go on in. You're over to the right - it's okay - there you are - you've got all the room you want now.

SCHMITT That's not as easy as in the Jay Bird.

CERNAN Okay. I think I'll give this rock box a quick dust in here. Pair of hoses - we've got to have a better way to store your hoses.

SCHMITT Yeah, I don't like them there either.

CERNAN I saw that when we went out.

SCHMITT Are you in?

CERNAN Sounds like it. Oh, come on get up there. Okay, Jack, coming up with the rock box. I'm not ready. I've got - I've got a - I've got a -

SCHMITT Why don't you put it on a porch.

CERNAN Now, I only have one other thing to do and let's clean up the TGE.

SCHMITT Okay, I've got to come up there any way.

CERNAN God speed the crew of Apollo 17.

SCHMITT Who signed it. I forgot to read it.

CERNAN I'm not going to tell you but I liked the but I liked the message. Probably shouldn't tell you.

SCHMITT That ought to stay up there.

CERNAN Okay, I can't hand you anything in anyway. I'm going down and clean up the TGE.

CAPCOM Rog, it should be ready to read by now.

CERNAN Hold that last step down again.

SCHMITT Okay. Not before - let me get this for you.

CERNAN Okay, Bob, 670 021 501, 670 021 501.

CAPCOM Okay, got that Gene.

CERNAN And the cover is up. Cover is up if I can keep it up. If I can keep it up. That'll keep it up. It's been dusted. And I'll get it to standby.

CAPCOM Okay, copy that and did you dust the radiator?

CERNAN Yes sir, I did that a little earlier. Okay, it is stand by, Bob. Radiator is up.

CAPCOM And dust it.

CERNAN Cover is open. Okay I'm going up to the porch. All I've got down here is ETP and it's on the LEC.

CAPCOM I'm ready for you.
CERNAN Got anything else?
CAPCOM Negative.
CERNAN I'm ready for you up here. Let's see
what kind of dusting job I can do on myself. Okay, Jack come
up.
SCHMITT Okay.
CERNAN Okay. Okay.
SCHMITT A little higher.
CERNAN GARBLE.
SCHMITT I've got it.
CERNAN Watch the seal.
SCHMITT Okay. Okay, here's an SRC (GARBLE).
CERNAN Put it in here. Oh, me. Well, I'll get
it up for you.
SCHMITT That's all right.
PAO Handing the rockbox into the LM.
CERNAN Ah.
SCHMITT I'll watch that.
CERNAN No sense making it hard. See if I can't
stand this one up. Okay. Okay, here come the core tubes.
Boy that's - protect that core tube. Hey, that - that was the
turning point today.
SCHMITT Got it?
CERNAN Got it.

END OF TAPE

CERNAN That was a turning point today. Got it?
SCHMITT Got it. Yes, we had a lot of turning
points.
CERNAN Do you want the LEC in there? You don't
do you?
CAPCOM Negative, leave the LEC outside.
CERNAN No, just the bag. Where are the scissors
by the way?
SCHMITT They're in the bag.
CERNAN Okay, I hope they don't come out this time.
SCHMITT Yes, I stuck them down in there, I hope
they don't -
CERNAN Yes, Jack. We'll have to figure out
something else, if they do.
SCHMITT I think so, Bob. I'll take a peek down there.
If they fell out, they'll be right on top. Okay.
CERNAN Momma mia.
CAPCOM Okay, Gene, and have you got the SCB number
2 in and the pallet out, right?
CERNAN Right.
CERNAN Here comes Jack.
SCHMITT There are no scissors on the ground, at
least where the ETB was so I would say that they're probably
in the ETB.
CAPCOM Well, good enough.
CERNAN You got everything, now?
SCHMITT Yes sir. Okay, let me get out of the way.
SCHMITT Whoops, that knee dumped it.
CERNAN Well, I guess I got about 25, 20, 50, I
guess 13 percent oxygen 3.8. Okay, Babe.
CAPCOM I copy that, 50 percent oxygen, Geno -
CERNAN Through that hole.
CERNAN Now, 13 percent I think.
CAPCOM 15.
SCHMITT Okay, put your buttons down, your gray one,
now your head up. Your right against the top, right against
the P27, come towards me, okay now up. Okay. Tight fit.
What am I caught on back there?
CERNAN You're just scraping against your PLSS.
SCHMITT Okay, I'll just bend.
CERNAN Watch your pockets, your leg pockets might
be part of the problem.
SCHMITT Okay, come on in, come in as close as
you can, okay, you're there.
SCHMITT Okay, let me just get on my feet here.
Oh, wait a minute, got to turn one way or the other.
SCHMITT Does this look better?
CERNAN Yes, turn toward your right.
PAO We marked Cernan in at 124 hours 8 minutes

PAO Schmitt in at 123 hours 59 minutes.
 SCHMITT Give me your left arm.
 CERNAN Where? Okay.
 SCHMITT Okay, let me make sure there's nothing
 in that hatch.
 CERNAN Well, there's dust, that's one thing
 that's in there.
 SCHMITT Take one quick peek. I can't -
 CERNAN From where I stand, all I can see is dust.
 SCHMITT Okay, it's clear. Did it.
 CERNAN What do we do next?
 SCHMITT Your pockets.
 CERNAN Okay?
 SCHMITT Okay.
 SCHMITT Primary water closed.
 CERNAN Turn our water off.
 SCHMITT Do you have to turn the primaries or the
 secondary, Bob.
 CERNAN Primary.
 CAPCOM Primary only.
 CAPCOM (garble)
 CERNAN Okay, I've got them both off, is that
 alright?
 CAPCOM That's okay, too.
 SCHMITT Wait a minute. Got yours?
 CERNAN No, I can't quite reach it.
 SCHMITT If you can roll to the left, I can get it
 for you
 CERNAN (garble)
 SCHMITT Let me get back here. I've gotten big-
 ger since I've been out there.
 CERNAN You've got to go more, you've got to
 go more.
 SCHMITT Yes. There's something keeping me from
 going more.
 CERNAN Okay, let me see if I can't -
 SCHMITT This is awfully far inboard for what
 I fitted it.
 CERNAN Okay, the primary water is off.
 SCHMITT Your LMP's water is off.
 CERNAN Go way over there so I can get the hatch.
 SCHMITT I have to go back the way I was.
 CERNAN Back up against the circuit breakers.
 SCHMITT Yes.
 PAO The EVA clock will continue counting
 until the LM is repressurized.
 SCHMITT Okay, now.
 PAO It shows 7 hours and 9 minutes 14 sec-
 onds now.
 CERNAN I can't, close and lock forward hatch -
 SCHMITT Can you do it?

CERNAN Yes, can't see it. Okay. Hatch closed.
SCHMITT Locked?
CERNAN And locked. Which one of those dump valves
is -
SCHMITT The one up on top.
CERNAN I can get that one.
SCHMITT Okay. Take it easy.
PAO Hatch closed at 124:11.
CERNAN And it's locked.
SCHMITT Is that locked there?
CERNAN Yes, sir.
SCHMITT Okay.
CERNAN And it is AUTO.
SCHMITT Okay.
CERNAN Okay, I got a tone and a (garble) flag
SCHMITT Okay.
CAPCOM Roger, Jack.
SCHMITT Litho 2 is now listed 10 percent.
Okay, let's go -
CERNAN We're not ready to go to manual control
repress?
CERNAN Okay, I've got to turn -
SCHMITT Okay, let me get out of your way, okay -
about as far as I can go.
CERNAN Okay, I'll read it to you, when you get
there.
SCHMITT I think part of our problem is - there's
no perches - as my Father used to say - no perches.
CERNAN Okay, are you ready? Are you ready?
SCHMITT Wait a minute.
CERNAN Hey, John, cabin repress in AUTO at 16 .
I need you.
SCHMITT Okay.
CERNAN Okay, cabin repress to AUTO.
SCHMITT Going AUTO.
CERNAN Okay, ECS cabin repress, CLOSED.
SCHMITT Okay, stand by - for repress. I'll try and
get that cabin - that master - okay, there's the master alarm.
PAO Cabin pressure coming up, half a pound.
CERNAN Okay, verify cabin repress (garble)
SCHMITT Now?
CERNAN Now.
PAO A pound and a half now.
CERNAN Okay, I want your PLSS O2 off.
CERNAN When I give you a call give me a break at
2.5. Okay, now we're 3, can you get it?
PAO Two and one half pounds.
CERNAN I'll reach it for you.
SCHMITT It's off.

CERNAN Okay, (garble) cabin pressure stable, it's
okay, coming up at 3.6 (garble)
SCHMITT What's our pressure?
CERNAN Pressure is 4, let me just take a look
here at 4.6.
CERNAN Okay, cabins up to 5, Jack.
SCHMITT Okay, it's 5 and shut off.
CERNAN Okay, I'm about depressed.
SCHMITT So am I.
CERNAN Okay, those EVA configurations, white
dot dot and EVA decals.
SCHMITT Okay, check it.

END OF TAPE

CERNAN Both EVA configuration, white DOT DOT,
and EVA decal.
SCHMITT Okay, checking.
PAO EVA clocks show the duration of 7 hours
12 minutes 13 seconds.
SCHMITT And look -
PAO It's counted until the pressure reached
3-1/2 pounds in the LM
SCHMITT White dots?
CERNAN Okay, they're all out here. Boy it
feels good to get out of this suit. Oh, my hands. -
SCHMITT Okay, they're all right here.
SCHMITT Okay, on 16, suit fan #2 closed.
CERNAN Suit fan 2 closed.
SCHMITT And suit fan Delta P closed.
CERNAN Closed.
SCHMITT ECS caution, and water sep lights
on.
CERNAN Okay, ECS - I think it's on. It's
hard to see it. Okay.
CERNAN (garble) halelujah.
SCHMITT Cabil stable, Houston. How's it look
to you?
CAPCOM Looks good to us, 17. And like you
to know you had a 7 hour and 12 minute EVA from 3.5 to 3.5.
SCHMITT Well, until I get out of this suit, I'm
still EVA.
CAPCOM Roger and I think it's a tremendous job for
what we might call a challenging EVA.
SCHMITT Ah, does that feel good. Whooh.
CERNAN Bob, that's no pund, it really was.
It really was.
CAPCOM I know it men, I know it.
SCHMITT I tell you, I really wish you guys could
have been here with us. You worked as hard as we did if
not harder.
CERNAN Harder, I think. Until today. OH! You
don't have a tub of hot water, I can soak my hands in do you?
SCHMITT Wait until that dust hits the sweat of
your hands. Oh. I tell you, the end. Okay, my clothes are
off. Doff helmet with visor, lower shades and stow at BRA.
CERNAN Well I guess the first thing is get
this thing off. Boy, let me tell you.
CAPCOM Okay, and 17, Jack and Gene I'll turn
you over to Joe now, I'll be back in a while.
SCHMITT Okay, Bob. Thank you for a job well
done.
CAPCOM Well, Job well done on your side, guys.
CERNAN Oh, I can't do it. How about getting
my glove off.
SCHMITT Can you handle it?
CERNAN Thank you. Jack, the big one's out of
the way. What we really had to get out there on. Boy look

CERNAN at that visor. No wonder I couldn't see.

CERNAN Jack, do you read?

SCHMITT Yeah.

CERNAN Okay, I thought you knocked your thing to A&R or to A or something. There's a lot of noise in the background. That's why I was wondering.

SCHMITT Need some help

CERNAN Store the visor, huh.

CERNAN What is it.

SCHMITT Yeah, store them in the BRAV.

CERNAN No, what I mean, keep the protective visor -

SCHMITT Keep protective visor, over it and store the whole thing over to BRAV.

CERNAN Okay I'll start on the descent. dump valve. I guess I can do that now.

SCHMITT Again. That one's still safe.

CERNAN And that one's still safe.

SCHMITT That was like gun powder, just like the boys said.

CERNAN Oh it does, doesn't it. Okay, descent water valve open. Oh, boy, I ran out of water out there. I mean the drinking kind. Okay, what's next?

SCHMITT Okay, Descent water valve open.

CERNAN Okay. On open.

SCHMITT Okay, and then you get your PURGE valve on.

CERNAN Smart, it shocked me. (Laughter)

SCHMITT (Laughter). Don't I told you so.

CERNAN Okay. Reverse your PURGE valve and disconnect your OPSO. (Laughter)

SCHMITT Yes sir (Laughter) If I can.

CERNAN Okay, (garble) core tube out. I thought that -

SCHMITT I'm glad there were two of us.

CERNAN I thought that old thing was going to break (garble) (Laughter)

SCHMITT The next time we have to do it.

CERNAN Yeah.

SCHMITT Yeah.

CERNAN The OPS. That must be this one. Disconnect OPS. Connect LM hoses restored blue to blue, I don't want LM hoses yet. I'll just get on water right away. I'm going to (garble) in this cabin. Okay.

SCHMITT You want me to get it.

CERNAN I tell you, my hands, after working - (garble) little things.

SCHMITT I feel the same way. I think you had the worst of it. Let's keep as much dust out of those connectors as we can. (Laughter) Wise guy.

SCHMITT Okay.

CERNAN Your (garble) horizontal?

SCHMITT Yep.

CERNAN Okay, if you can get to the suit-Flow, well you can go to (garble) In the mean time get your fan, your pop off.

SCHMITT Fan's OFF, pops OFF.

CERNAN Gordo, you still reading us down there?

CAPCOM Loud and clear, Gene. We're following you close.

CERNAN Okay. Just wanted to see if you were there.

CAPCOM Roger. Following you close here.

CERNAN Keep us honest.

SCHMITT Okay, we're just looking at 5 PSI and all the hatches are buttoned down, and the safety is on. You can keep a look at the rest of it for us.

CAPCOM Copy that. And we're standing by -

CERNAN Okay, now disconnect your PLSS water. Now what I do, Jack is - I was going to say put your cover on but we're going to stow those.

SCHMITT Okay, We've got to go off the air for a little while, we're both going 0. And we'll get on our LM comm here, shortly.

CAPCOM Roger. Check back in.

SCHMITT Okay.

PAO This is Apollo Control at 124 hours, 23 minutes. We've completed a shift handover here in Mission Control. Our flight director Gene Krantz and his team of flight controllers are replacing the Pete Frank team. Our spacecraft communicator on this shift is Astronaut Joe Allen. And aboard Challenger on the Lunar Surface, are Jack Schmitt and Gene Cernan, in the process of getting the Lunar Module reconfigured, ready for their sleep period which the flight plan calls for them to begin at 128 hours or about 3-1/2 hours from now. After they complete the reconfiguration of the Lunar Module and get the cabin more or less ship shape, they'll have - evening meal, eat period before retiring. And aboard the Command Module, we said good night to Ron Evans on the last revolution, the 18th revolution.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/12/72 01:18 CST 124:24 GET MC-493/1

PAO - command module, we've said good night to Ron Evans, on the last revolution, the 18th revolution of the Moon for the CSM, and we're just about to reacquire the command module, now on its 19th revolution, presuming that Ron Evans will be asleep. During the EVA, Evans was primarily involved with running the lunar sounder experiment. This was one of the major activities aboard the command module. That experiment appeared to be functioning well, obtaining surface and sub-surface data on the lunar stratigraphic sequences and structure. We have a change of shift briefing, which will begin in a little less than 15 minutes in the News Center Briefing Room, Building 1.

CHALLENGER Hello Houston, do you read Challenger on LM comm?

CAPCOM Okay, Challenger, this is Houston, reading you 5 by.

CHALLENGER Okay, we're going to go ahead and charge up - let's see the LMPs PLSS.

CAPCOM We copy.

CHALLENGER Hello, Houston, the recharge on the LMP 95 percent.

CAPCOM Copy that.

PAO This is Apollo Control at 124 hours 37 minutes. The participants for the Change of Shift Press Briefing are now on their way to the briefing room in Building 1. That conference should begin shortly. Here in Mission Control, Flight Director Gene status - or Gene Kranz rather has gotten a status from his Flight Controllers on both vehicles, both Challenger and America and both spacecraft appear to be in very good shape at this time. Aboard Challenger on the lunar surface, Gene Cernan and Jack Schmitt will now be involved in getting out of their space suits, getting the spacecraft cleaned up, ready for their sleep period and we expect to debrief them on the first EVA in about 15 minutes. Ron Evans now entering his scheduled rest period. America in the 19th revolution of the Moon at the present time. And, during our change of shift briefing, we'll be recording any conversation with the crew on the lunar surface for playback immediately following that briefing. At 124 hours 38 minutes, this is Apollo Control, Houston.

CHALLENGER Hello, Houston, it's CDR with recharge of 93 percent.

CAPCOM Sounds good Geno.

PAO This is Apollo Control at 124 hours 44 minutes. Our post EVA press briefing is ready to begin at this time, so we'll switch to the MSC News Center Briefing Room.

END OF TAPE

PAO This is Apollo Control at 125 hours 10 minutes. Jack Schmitt and Gene Cernan aboard Challenger on the lunar surface have been involved in getting the portable life support systems recharged for tomorrow's EVA. And we're planning to debrief them on the first EVA shortly. They are then scheduled to continue getting the LM cabin configured for sleep and they have some time set aside to eat and we hope to get them into their sleep period at the time called for in the flight plan, which is a little less than three hours from now. During the change of shift and we accumulated a small amount of taped conversation with the crew. We'll play that back now and continue to stand by live.

CHALLENGER Okay, Houston, OPS pressure LMP 6100 and CDR 5900.

CAPCOM Thank you, Jack.

CHALLENGER Joe, we're changing a cartridge out in my PLSS. We've got the batteries changed.

CAPCOM Okay, Gene-o, thank you.

CHALLENGER You don't have a cold something or other, do you?

CAPCOM I'm sorry you even mentioned it.

CHALLENGER We can think about it, can't we.

CAPCOM Mercy yes.

CHALLENGER Hey, does Captain America know all about this?

CHALLENGER Roger, Jack, he does. He's been fully advised and his response is - he's sound asleep now.

CAPCOM Yeah, I forgot, he was going to bed before we did today.

CHALLENGER Did he have a good day up there?

CAPCOM He surely did. Fine day. And I want to make the observation, as a casual bystander, it was a real pleasure to watch your EVA unfold down here.

CHALLENGER Thank you, Joe. I think you are more than a casual bystander though.

CHALLENGER Hey Joe, we've got - one and three - correction, one is replacing the three and two is replacing the four on the PLSS.

CAPCOM We copy.

CHALLENGER Joe, we're in the right hand column of 3-3 now.

CAPCOM Roger.

PAO That completes our tape playback. We'll stand by live now.

APOLLO 17 MISSION COMMENTARY 12/12/72 02:03 CST 125:10 GET MC494/2

CHALLENGER Joe, bag - collection bag 2 is 6T.
CAPCOM Thank you.
CHALLENGER And the SRC is 32 pounds.
CAPCOM Copied 32 pounds.
CHALLENGER Okay, Joe, the heater is on for the
dump.
CAPCOM Okay.
CHALLENGER Okay, Joe, the circuit breakers are
verified. It's about 11 and 16 with exception of the line
heater.
CAPCOM Okay, copy that. Thank you very much.
CHALLENGER Okay, Houston, we're going to turn the
biomed off.
CAPCOM Okay.

END OF TAPE

PAO This is Apollo Control, Gene Cernan's report that he was disconnecting his biomedical harness tells us that he and Jack Schmitt are in the process of getting out of their pressure suits, and that puts them about 25 minutes behind the Flight Plan Timeline. However, there is a fair amount of pad built into the Flight Plan during this period, up through the eat period and beginning with their sleep period, and we do expect to get them to bed on time. We also earlier, got a report from them on weights - sample weights in sample collection bag number 2 and also in the sample return container, the rock box that was brought back aboard the lunar module. They reported 16 pounds for the sample collection bag, 32 pounds for the rock box. These are the gross weights, and we'll be coming up with net weights based on the estimated weight of the containers and other equipment. They are usually packing equipment stowed on the rock boxes. As soon as we have a net weight for the samples we'll be passing that along. The next activity scheduled in the Flight Plan is the EVA debriefing and we expect that that will be occurring in the next 30 to 45 minutes.

END OF TAPE

CHALLENGER Houston, Challenger, we'll both be off the air briefly here as we swing into getting our suits and LCGs off. The commander presently has his suit off, and I'll start on mine.

CAPCOM Roger, Jack.

PAO This is Apollo Control. It now appears that the crew aboard Challenger on the lunar surface, Jack Schmitt and Gene Cernan will be ready to begin the EVA debriefing in about 20 minutes. We're estimating that they'll reach that point in the Flight Plan at about 126 hours 10 minutes. And, the debriefing will run 15 to 20 minutes. Ron Evans aboard America has been asleep now for about an hour and a half. We'll be waking him up at the ground elapsed time of 131 hours 20 minutes after about 8 hours of rest. America is presently in an orbit of 69.9 by 53.5 nautical miles, on the backside of the Moon in its 19th revolution, just about to cross over to the 20th revolution the beginning the 20th revolution, and we'll be reacquiring contact with that spacecraft in about 30 minutes.

CHALLENGER Hello Jo, you there.

CAPCOM Waiting patiently.

CHALLENGER Okay, if you're keeping score on the bottom of 3-4, we're both out of our suits, and does that feel good.

CAPCOM Roger, Gene thank you.

CHALLENGER Okay, I'm out of my LCG if you want to turn the page.

CAPCOM Okay, Geno, and how are your hands feeling?

CHALLENGER Oh, they're a little tired on both sides here.

CAPCOM Can't imagine -

CHALLENGER But I think they'll pull through.

CHALLENGER Do I read this that the LMP sleeps on bio tonight, is that right?

CAPCOM Stand by. Rog, that's affirm.

CHALLENGER Okay, so I can take mine off, my sensors?

CAPCOM That's affirm, Gene.

CHALLENGER Okay.

CHALLENGER Well, we'll - we'll be up to the EVA debriefing time here very shortly.

CAPCOM Rog.

END OF TAPE

CHALLENGER Joe, do you know how much time has elapsed since we initially charged our PLSS's with O2?
CAPCOM Geno, it's time to charge them again, if you want to.
CHALLENGER Okay, I just might pick that up.
CAPCOM All righty.
CHALLENGER We'll let you know where we are though.
CHALLENGER Say, Joe, I guess the home front was probably listening in - any one talked to them?
CAPCOM Haven't talked to them today, Geno. I haven't at least.
CHALLENGER Hello, boss, how are you doing down there?
CAPCOM Just, fine. Waiting for you guys to go to sleep so we can do the same. Had a great day up there guys.
CHALLENGER Oh, you don't have to wait for that. We're - ah it was super from here - quite an experience, Deke, and quite a challenge.
CAPCOM Yeah, it looked beautiful from here.
CHALLENGER I tell you it makes you feel like you had a good days work behind you though.
CAPCOM I can believe that.
CAPCOM We're about to give you the rest of the day off, Gene.
CHALLENGER Thank you, Joe.
CAPCOM Geno - while you -
CHALLENGER Hey it's 3 o'clock in the -
CAPCOM Say again.
XCHALLENGER I was just going to say it's 3 o'clock in the morning back there.
CAPCOM We know it.
CAPCOM It's 3 o'clock in the morning up there too.
CHALLENGER And we know that too.
CAPCOM Troops while you're in a listening mood up there we're going to be coming at you with a number of items here - not too many - but the first will be some surface block data. Then we're going to read up to you a LEVA cleaning procedure which is fairly simple, a real short geology debrief, one line change in the lunar surface checklist and then we've been doing some thinking down here about how to fix the fender, and it's going to involve, we think, although we'll work on it while you guys are getting some rest, it's going to involve using utility clamps from inside your LM there instead of tape to fasten some sort of stiff material onto the rover in place of the missing fender. And what will go either with one of your - your cue cards or possibly with part of insulation that with the flame blanket protecting the rover during the landing or perhaps part of the packing material that was between the rover wheel and is probably lying on the ground underneath the LM there.

CHALLENGER Joe, you couldn't be reading our mind more. We were talking about that and there is a piece of it right outside my window. I saw it after we got in here. Either that or back of a part of a data book or something - I hate like the devil to tear one of those other fenders off. The reason the fender won't stick is that everything's got a fine coating of

dust and the only way I could finally get it to stick was to put tape on it - rip the tape off - or take the tape off - which took some of the dust off and then tape would tend to hold it but it just won't hack it up here.

CAPCOM Roger, Gene. That's exactly what we're thinking and what we're going to do is run through the fix in a pressure suit a few hours from now and if it looks like we can do it and it won't cost you many more than say 10 minutes we're going to have you go through with it. If it takes longer than that we're going to go back to the drawing board and see what else we can do here.

CHALLENGER Well, you know John and Charlie can tell you just had bad it is. I wouldn't have believed it - I guess I didn't believe it, or I would have worked a little harder to make sure that fender was going to stay on, but - man just that short trip back from where we lost it and we were just covered. The whole - I couldn't even read the parts of the panel on the rover, plus all the battery covers and everything.

CAPCOM Roger, Gene. What we really need, I think, is some white mud flaps up there.

CHALLENGER That's a little too old fashioned Joe.

CAPCOM I guess we'd know wouldn't we.

CHALLENGER I'm afraid so.

CHALLENGER Okay, Joe, MARK, I'm giving my PLSS a second charge right now.

CAPCOM We're watching.

CHALLENGER You sure of that?

CAPCOM You should be getting LMP biomed.

CHALLENGER And Joe give me a hack after about 10 minutes in case I forget on that PLSS recharge.

CAPCOM Roger.

CHALLENGER Can I do both the - I can do both the water recharge and the O2 recharge at the same time, can't I?

CAPCOM That's affirm.

CHALLENGER Okay.

CAPCOM Gene, I caution not to tilt the PLSS while you're doing that.

CHALLENGER Yeah, good idea. Mine's in the station.

CAPCOM And Gene if you want to get the geology debrief out of the way anytime just give us a whistle on that.

CHALLENGER Joe why don't you give me the block data and then we can go to the geology brief.

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CAPCOM Okay, are you ready to copy?

CHALLENGER Go ahead.

CAPCOM Okay, Jack, surface block data liftoff times, T21, 128, 147, plus 12. T22, 130, plus 45, plus 44. T23, 132, plus 44, plus 18. T24, 134, plus 42, plus 50. T25, 136, plus 41, plus 28. Over.

CHALLENGER Okay, Joey, 21 reading in order 128, 47, 12, 130, 45, 44, 132, 44, 18, 134, 42, 50, 136, 41, 28. And what's the present REV?

CAPCOM Present rev is 20 and readback is correct.

END OF TAPE

CHALLENGER Okay, Joe, you can go ahead and fire away at the LMP.

CAPCOM Okay, Jack, and for the geology questions, I'm going to turn the console over to the well known geologists of the seifort galaxies.

CHALLENGER Can't hack it, huh? you've all forgotten everything I taught you.

CAPCOM I draw my sword.

CAPCOM Okay guys, you want me to address first those to Gene - those to Jack and then address them to Gene later on or you guys both want to answer them at the same time?

CHALLENGER Well, we're both listening. We can answer them.

CAPCOM Okay, the way you asked that, I wasn't sure.

CAPCOM Okay. Question number 1 is - concerns the rover mobility rate. The rover mobility rates over the short spans you drove, which is hardly representative, are slower than people had anticipated. Do you think this is due to visibility, terrain, or what? Do you think you can still hack at 7.3 or 8 kilometer minimum or average to station 2 tomorrow?

CHALLENGER The answer to that is yes, Bob. I think it's partly - partly fam but it's also the fact that we did a lot of circling. We didn't drive in many straight lines. Trying to find, for the most part, our bearings and tried to pick some high spots so we could look around. So I think straight line navigation out in the area we're going is going to be easily 8 kilometers.

CAPCOM Okay, great.

CAPCOM Okay. Another question here, Gene, that you should be able to answer with a simple yes or no. Was there any spillage of the material in the drill core while you were breaking it down?

CHALLENGER Simple no.

CAPCOM Okay. And -

CHALLENGER Spillage out of it?

CAPCOM Yeah, you know, when you broke the sections did you lose much material out of it.

CHALLENGER No sir, I didn't lose any.

CAPCOM Okay, next simple question. In the - when you were drilling the deep core where the neutron probe was, could you see the RTG over the rock?

CHALLENGER Yeah.

CAPCOM Okay. You have any feel for how high the rock is or how low - how deep the thing was in respect to the - with respect to the RTG? Where you down in a level that was below even without the rocks being there?

CHALLENGER Yeah, I think I - yeah, I was in a - in a slump. There was a ridge between us and the RTG and I had the rock in a line of sight between it and where I put that core. And I'll say the rock was certainly near the ridge and it was - what, Jack? - I don't know was it meter to - meter high for the most part. And it sloped off and I'd say at least a half a meter high in the line of sight from where the neutron probe is to the - to the RTG. There's a lot of undulation - I think it'll be on the line of sight anyway.

CAPCOM Okay. And a somewhat more general question, here. It says - and I'll read it. We're still puzzled as to whether there is a dark mantle. Could you say something more about the dark regolith surface? There's a lot of discussion today about whether or not it could have been a regolith derived from the intermediate gabbro from which you were sampling as boulders.

CHALLENGER Bob, I - I think I don't have to much to add to what I said near the end of the EVA, is that I do not have an intuitive feeling that the regolith has been derived from most of the boulders we're seeing. But, because those boulders are fairly light colored. They look like they're probably 50 percent plagioclase. The - it could be that the regolith is derived from some other material that is blank at the area. I don't think we have that answer, yet.

CAPCOM Okay. I copy that.

CHALLENGER Bob, the boulders - the boulders we are sampling - I think Jack and I both feel that it's probably - we feel we sampled the sub-floor because we saw on the sides of the craters where some of these boulders were exposed almost as if it were bedrock down there. In driving back from what we call'd station 1 we - we could definitely see the light mantle out in the area where the potentials of the slide are.

CAPCOM Okay, very good. Yeah, I think that the - at least it's a going bet around here that we're sampling the sub-floor when we're sampling, at least the top of the sub-floor when we're sampling the intermediate gabbro there. The rocks and the boulders.

CAPCOM Okay. We also -

CHALLENGER Yeah, the -

CAPCOM Go ahead.

CHALLENGER Bob.

CAPCOM Go.

CHALLENGER It is sort of strange that we don't see a good population of fine - of finer grain rocks. These rocks look very much like igneous rocks but they're considerably coarser than comparable - well, they're about the grain size of some of the coarse grain mare basalt that tend to differentiate the crystodalite and tridimite but we didn't see any of the finer grain versions. If it's an intermediate crystalline rock we have not seen any fine grain equivalents yet. At least not in abundance.

capcom Okay, I copy that.

CAPCOM We get - we gather that there's no color change in the dark mantle material at depth. In other words the footprint, wheel tracks, and the rate sample, etc. was sort of uniform in color.

CHALLENGER No, there's no major change but looking out the window and I think I commented on it, the disturbed regolith is darker. Oh, I don't know, maybe by 10 percent albedo, something like that, than the undisturbed surface.

CAPCOM Okay, I remember your commenting that when you were walking to the ALSEP, I think, Jack, in fact.

CAPCOM Okay, during drilling of the Heat Flow holes, Gene, -

CHALLENGER That's right.

CAPCOM Was there change in color of the cuttings as they piled up - as you went down in depth? Do you remember any of that?

CHALLENGER Yeah, Bob, both in the core and the heat flow holes it really didn't - didn't seem to pile it up like you're accustomed to it at the Cape and I guess maybe that's because I was kicking so much dust around there. But I looked specifically when I cleared flutes and what have you and I didn't see any difference in terms of color, texture or anything else coming up.

CAPCOM Okay, copy that.

CAPCOM On the outcrops you think you see in the North and South Massif. They appear to be linear horizontal or sub-horizontal. Can you see layers and do you have any feel for the thickness or the attitude or the continuity of them? Can you discuss these outcrops?

CHALLENGER Bob, the - going over yesterday I thought I could see a structure dipping off to the southeast, apparent dip anyway, on the eastern side of the South Massif. Or

CHALLENGER north eastern side. We haven't examined them in detail because we were in a rush to get out. We'll put the binoculars on them and try to examine that question. There's nothing very obvious any more than you can see on the photos that the ledges were concentrated in the upper portion - excuse me - in the upper portion of the Massif units.

CAPCOM Okay. We copy that.

CAPCOM Here's a short one that I'll ask Jack since he did it. Again I guess we'll have to prove this - the shaded portion of the cosmic ray experiment. The question is and I repeat - I quote - "Are you sure that the detectors, not the decals were facing out?"

CHALLENGER I am, Bob, because I said I was sure and I called you on it.

CAPCOM Roger. I was sure too, but I had to ask the question.

CHALLENGER I - I under - I know I understand why it was asked because I did it wrong at the Cape. But that's why - that's why I mentioned it when I deployed it.

CAPCOM Roger.

CAPCOM And ready to - Okay, and we can go and recharge the other PLSS whenever you're ready there, guys.

CHALLENGER Okay.

CAPCOM Okay, the next question, which calls for a little bit of discussion is - the layers of lineaments you remarked on in the Sculptured Hills -

END OF TAPE

CAPCOM Okay, the next question which calls for a little bit of discussion is: The layers of liminents that you remarked on in the Sculptured Hills, can you say anything about them?

CHALLENGER Yeah, I think I did, I think I said - I commented, I'm not sure whether it was the Sun angle or not but see, I was not looking at the Sculptured Hills I was looking back at Bear Mountain, I believe. And, to me it looked like there was some organization that was dipping back to the East somewhere between oh 20 and 25 degrees maybe; and it was very obvious to me, but I'm a little - a little hesitant because of some of this Sun angle stuff.

CAPCOM Okay, I copy that. I gather we didn't get any 500 millimeters of these lineations, is that right?

CHALLENGER No, but I think we will. I - they were on the western side of Bear Mountain back there, and I think I commented that I thought that Bear Mountain is probably what the Sculptured Hills look like.

CAPCOM Okay, I copy that. Is there a scap above the light mantle material. In other words the slide, is there a scap above that on the South Massif, can you see anything up there to indicate that it might have come off of there.

CHALLENGER Nothing obvious yet Bob.

CAPCOM Okay copy that. On the way back to Station I, you described a small crater with light material on the bottom, can you say anything more about that crater?

CHALLENGER Bob, I don't remember saying that, and Gene doesn't either.

CAPCOM Okay. You talked about something that was light I don't remember - I thought it was a boulder, but the question's about a crater.

CHALLENGER You're right. You're right, there was a large zap pit in a boulder that was very white. It must have been - the crater for the zap must have been 2 centimeter anyway, and it had about that or maybe 3 centimeters worth of crushed minerals around it that gave it a white, very bright light appearance.

CAPCOM Okay well that was indeed a small crater, so I guess the question was right.

CAPCOM Let me change the mode here and ask you 3 or 4 simple ALSEP questions again to verify for various people exactly what happened just to make sure that they're clear on it. Jack when you were laying the geophone leads, you mentioned - you asked if it was all right if the geophone leads crossed one another, if there was EMI problems, and so that made people wonder whether or not it was possible the geophone positions were reversed, i.e. geophone 1 was laid out in geophone 2s' direction et cetera.

CHALLENGER No, that was just a geophone 4 problem. The geophones are in the right direction.

CAPCOM Okay.

CHALLENGER Geophone 4 fell out of the module and rolled

CHALLENGER under one of the other lines or vice versa, I don't know which and it's crossing one of the other lines, geophone 1, I think.

CAPCOM Okay, no problem. Was the - when you went to put the LSPE antenna in the heat flow socket, you didn't have - weren't able to do it at first, was it because of there was a lot of dust in there.

CHALLENGER No, I think it was the same old problem of that piece of - of aluminum foil or whatever it is going down in the socket and jamming briefly.

CAPCOM Okay I copy that. Did you clear out that foil when you did it, or did you just push it on through?

CHALLENGER I pushed it.

CAPCOM Okay. When you taped the SEP solar cells down, did you - how much of them did you cover with tape?

CHALLENGER We taped the back.

CAPCOM Ah, very good thinking. And Geno on a question for on the rover when you parked it, do you have any feeling for the roll angle it was parked at at the LM, the roll angle.

CHALLENGER Let me look. Bob, it's pretty flat, if I had to guess, I'd say zero, and you can bias that by a degree or so but basically zero.

CAPCOM Okay, is the pitch scale on it, or did it fall off yet?

CHALLENGER Now, I was going to comment on that, it's still there.

CAPCOM Okay very good. Okay when you went to Station I-A, we're calling the new station, Station 1-A, were the blocks there as well filleted as those near the LM and the ALSEP, do they all look the same?

CHALLENGER Bob, they - all the boulders had filleting or to a slight degree, but not an extreme amount. I think it no more than what is being caused by the redistribution of the darker fine grained regolith.

CAPCOM Okay, I copy that -

CHALLENGER Bob, if had to -

CAPCOM Go ahead.

CHALLENGER Bob if I had to answer that question I'd say yes. Yes that the base of the boulders are filleted about like they are over here, those would be my impressions.

CAPCOM All right. Is there any indication that the fillets are directional, in other words that the fillets are heavier on one side than the other?

CHALLENGER Bob, haven't noticed that.

CAPCOM Okay, I copy that. Do you have the feeling that some boulders more -

CHALLENGER Well that's a good -

CHALLENGER - that's a good -

CAPCOM Roger, I agree with you.

CHALLENGER That's a good reminder, Bob.

CAPCOM Okay, do have any feeling that some boulders are more rounded than others? Apparently this looked this way in some of the TV pictures.

CHALLENGER Some of the big ones that are just barely exposed above the regolith looked quite well rounded. Most of those around the craters are sub-angulars. I think - I got the impression that it's just purely a function of how long the same material's been exposed; but some of the big boulders like the one out near the geophones is quite angular in part and quite rounded in other parts. It's quite variable.

CAPCOM Okay, do you want to say any more about that boulder? Did it seem to have more or less the same morphology in addition to the variation in vesicle size that the other rocks in the vicinity of the ALSEP and the other rocks out at Station I have?

CHALLENGER It's very comparable to the ones that we saw at Station I, as a matter of fact.

CAPCOM Okay, I copy that.

CHALLENGER Both types of rocks were there, both variations.

CAPCOM Do you have a feeling for where big blocks in the LM ALSEP area came from? Do you think they were from Camelot, like I've been saying?

CHALLENGER Don't have an idea yet, I'm really not sure.

CAPCOM Okay, and as you drove along on the traverse from the sep to Station I does the size of the small craters with blocky rims vary? In other words what we are looking for here is the variation in the thickness of the dark mantle?

CHALLENGER I can't answer that one yet, Bob.

CAPCOM Okay. Let me sum up by saying, I guess as I indicated before, our best guess is that the vesicular crystalline rock probably gabbro, I think you've been calling intermediate basalt or gabbro forms at least the upper part of the sub-floor. I don't think we've been close enough to a large crater rim to say that it's a - what the deep sections of the sub-floor are formed, but we think that this intermediate gabbro vesicular rock, at least medium grained, perhaps coarse grained rock forms at least the upper layer of the sub-floor. Over.

CHALLENGER Bob, I think that's pretty safe, right now. I

END OF TAPE

SCHMITT Yeah, Bob, I think that's pretty safe right now. Once again I'm surprised that it's as coarse as it is, that being the upper portion of a plane's unit.

CAPCOM Roger.

CERNAN Say Bob, driving back from - from station 1, driving back from station 1, where we did some of our circling and what have you, we didn't have time to get off, but we did see down in the, I don't remember whether it was in the slopes of some craters, or down on the slope itself, but I'd say several meters down below the mantle where there was, what we almost agreed to, might be bedrock, at least, a deeper portion of the subfloor.

CAPCOM Okay, well, I think we'll get to it tomorrow. I think I might just give you a clue to our thinking for tomorrow, I don't think we've seen, or done anything to day that is going to make us change very much from the nominal station of - nominal EVA 2 plans. In fact we didn't get the station - to the EVA 1 at the large boulders at Emory. It's probably going to mean that station 5 might be shifted a little bit to the boulders on Camelot, but the certain stations thrive on the subfloor, and also to station 10, it assumed a higher priority than it originally had. Other than that I don't think we'll see an awful lot of changes to EVA 2. Over.

SCHMITT Okay, Bob. I think that's safe. I suppose somebody's thinking about the possibility of going down to Emory. Maybe you just said that. Going down to Emory late in EVA 3.

CAPCOM I think at the moment they're thinking primarily they're going to station 10, and not going to station 1.

CAPCOM Okay, Jack, I wrested control -

SCHMITT Some of your experts might think about -

CAPCOM Go ahead.

SCHMITT Some of your experts might think about what they might expect to happen to put the regolith on a bigrain pyroclastic would look like.

CAPCOM Okay.

CAPCOM We'll tell them, I'll see you tomorrow guys.

CERNAN Sleep well, Bob. Okay, I've just got one question, Bob before you run off. Did the TGA perform okay, with the - with the camera on?

CAPCOM As far as I could tell, Gene, it did, matter of fact, I didn't see the Gravimeter people afterwards to talk to them. But as far as I could tell, it did. We had one funny reading back at the LM very early when it was on the ground, which I'm at a loss to understand right off. Other than that everything seems to have gone very well. The readings were quite uniform, in fact, but, that's what makes you think they went well.

CERNAN Okay, well, I'd like to leave it. You know it's a little change in my thinking. I'd like to leave

CERNAN it on the Rover. If we can't although, it's a piece of cake to take off. It's very difficult to lean over that bar without loosing your balance and taking your readings and what have you. So if we can leave it on, it would be far better.

SPEAKER Roger. I was noticing that. And I also noticed you only three ball reading we got, was when it was on the ground.

CERNAN Yeah.

CAPCOM Gene, and Jack, if you'll get Lunar Surface checklist to 3-5, I've got an easy change to read up to you.

CERNAN Go ahead.

CAPCOM Okay. After the line empty MTB as follows, change the first line which reads, B&W Mags Golf in forward RHFSC to read, B&W MAG Hotel, in LGC compartment. And then go on to the next column, which begins, stow in ETB, change the second line which reads, LMPs camera with B&W MAG Hotel to, LMPs camera with B&W MAG Golf. That's MAG G, ETB. Over.

CHALLENGER Got you. Hotel, stow it and go out with Golf.

CAPCOM That's got it. And I've got a LEVA cleaning procedure which maybe you could pencil in there, it's an easy 3-step procedure. And I'll go ahead and read it step by step here. Step number 1, is tap LEVA base to remove loose dust. Step number 2, reads, if excess dust still remains use a towel from the LM tissue dispenser, which has been wetted with water, and gently wipe the visor from the top to the bottom, that is in one direction. And fold this towel after each wiping to keep the contact surface clean. There's a note. Take care not to wet the inside of it, that is the concave surface of the gold visor. And the last step is, allow it to air dry. And that's it on the LEVA cleaning.

CHALLENGER Okay, Joe, we got that. The Commander's PLSS is at its final charge and we're in the process of working on the LMP's PLSS now.

CHALLENGER I guess there's no way to verify how much water you've got in there except to go through the procedure.

CAPCOM That's right, Geno. And we think you fellow have earned a good meal now, and maybe you can take the rest of the day off.

CHALLENGER Okay, Joe. Thank you.

PAO The CAPCOM during the EVA Geology debriefing was Astronaut Bob Parker, who was CAPCOM during the EVA. Joe Allen is now handling the CAPCOM duties once again.

PAO Ron Evans aboard America now has -

END OF TAPE

PAO Ron Evans, aboard America, now in his 20th revolution of the Moon, just passed over the landing site a few minutes ago, and appears to be sleeping soundly. Ron has been asleep for about 3 hours now. And telemetry data on America shows the vehicle to be functioning normally, as are all of the scientific instruments with a couple of relatively minor exceptions, the mapping camera has not been retracted, it is somewhat slow to retract the last few times that that maneuver was performed and the camera has been left in the extended position, which is in normal operating position for the mapping camera. And we expect, as you heard, CAPCOM Joe Allen advise the crew that Gene Cernan and Jack Schmitt will begin eating shortly, and we hope to get them tucked in for bed by about 128:00 hours or about 1 hour from now.

CERNAN Okay, Joe. Just to bring you up to date on magazines. Mag bravo has 77 frames.

CAPCOM Okay.

SCHMITT Mag hotel has 83 frames.

CAPCOM Roger.

CAPCOM Jack, on you mag hotel, we showed you all the way up to 183 at one time on that. Did you miss the 1, this time?

SCHMITT I may have clipped it out, Joe, 183, yes.

CAPCOM Okay, yes, you did clip it out, clipped it out cleanly so, thanks for verifying that.

SCHMITT Joe, mag Romeo has 21 frames, and I took a few random, and probably not very good 500 millimeter of the north and south Massif.

CAPCOM Okay, Jack. Thank you.

SCHMITT And Joe, verify that you want mag Charlie substituted for Mag Bravo on the CDR's camera.

CAPCOM Stand by.

SCHMITT Don't get me wrong, I think it's a good idea, Joe. Don't let everybody work all night on that one.

CAPCOM Jack, I think the answer to that is yes, per the checklist, by the way. That's the way we show it in our checklist here.

SCHMITT Roger. We just have - probably have about 100 frames left on Bravo, but we'll just keep track of that.

CAPCOM Jack, it'll go out later on, that Bravo will - apparently, it's kind of your backup magazine there.

SCHMITT Okay.

CAPCOM The reason being, we want to start that EVA 2 with a fresh mag.

SCHMITT Hey, Joe. Bob told us earlier, the sounder looked like it was working.

CAPCOM Gene and Jack, just a general comment on that. SIM BAYS cooking along beautifully. We are getting

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CAPCOM Lunar sounder data. It looks quite interesting. We've only got one or two annoying problems, but it's nothing major, that is with the Sim Bay, not with the sounder, one of them being that the usual mapping camera extend problem, and we've just decided to leave it extended and it will serve it right if it gets a little contaminated with an occasional dump. And I guess there's a minor problem with one of the big antennas. It didn't pass its retract test properly so I guess it may have to be jettisoned when we do a plane change. Otherwise, things are working beautifully. Over.

SCHMITT That sounds great, I'm glad to hear that.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/12/72 CST 04:07 GET 127:13 MC502/1

PAO This is Apollo Control at 127 hours 33 minutes. The CSM America has just gone behind the Moon now on the 20th revolution. The spacecraft looking very good. When last we had telemetry data on it. And, Ron Evans continuing to sleep soundly. He's been asleep now for about 3-1/2 hours. On the lunar surface, Gene Cernan and Jack Schmitt aboard Challenger are eating at this time, and we hope to get them to bed by about 128 hours or about 27 minutes from now.

END OF TAPE

CHALLENGER Houston, Challenger.
CAPCOM Go ahead.
CHALLENGER We're sort of around 2730 in the checklist more or less, and you want the power amps and PCF?
CAPCOM Ready when you are. And, troops, are you raiding the pantry up there yet?
CHALLENGER Yes, we are. We've been hitting it as hard as we can. Okay, power amp is going to primary and PCF to high. And, while we're waiting for Gene to look at his computer, should I do the battery management?
CAPCOM Jack, stand by until we get the high bit rate on that battery management. And, a reminder, are you recharging that PLSS number 2 there, or have you taken that off the line.
CHALLENGER No, we're through with that. We caught it with 10 minutes.
CAPCOM Okay. We've got high bit rate now. Go ahead with battery management.
CHALLENGER Okay, we'll play it -- Gene'll work the computer, and I'll work the batteries, and the ED volts are 37.2 both batteries.
CAPCOM Thank you.
CHALLENGER Okay, you got P00 in data, Joe.
CHALLENGER Okay, Joe, the battery management complete. How does the rest of the spacecraft look, what you can see of it?
CAPCOM Okay, Jackie. Copy that battery management complete and Challenger's looking beautiful from down here.
CHALLENGER I guess you don't have telemetry on dust yet, huh?
CAPCOM Negative on the dust. And the computer's yours. Sounds like you've got hay fever sensors, as far as that dust goes.
CHALLENGER It's come on pretty bad just since I came back. I think as soon as the cabin filters most of this out that is in the air, I'll be all right, but I didn't know I had lunar dust hay fever.
CAPCOM It's funny they don't check for that. Maybe that's the trouble with the cheap noses, Jack.
CHALLENGER Could be. I don't know why we couldn't have gone and smelled some dust in the LRL just to find out.
CAPCOM Goodness knows, we tried.
CHALLENGER Okay, I'll wait for your cue on the rest of it.
CAPCOM Okay, Jack. Telemetry PCM low and your power amp off, please.
CHALLENGER Roger.
CAPCOM Challenger, this is Houston requesting down voice backup, and then configure your ECS for sleep at your convenience.
CHALLENGER Okay, we're working in that direction. Down voice backup now.

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CAPCOM Okay, Jack and Gene, and, unless you've got questions or we can help you out in some way, we'll say goodnight to you.

PAO This is Apollo Control at 127 hours 51 minutes. Cernan and Schmitt are now completing the items in the presleep checklist.

CHALLENGER The reason I say that, Joe, it's going to be another 30 minutes or so anyway before we -- probably more like an hour before we actually close our eyes.

CAPCOM Roger, Gene. You think you'll be able to use about 30 more minutes of sleep tomorrow morning? What's your wish on that?

CHALLENGER Yeah, I'd like to try to get the full amount. As I recall, tomorrow's a little bit flexible; if we get up 30 minutes late, it doesn't really hurt us.

CAPCOM Sounds like a good way to proceed. We'll give you the full 8 hours. Goodnight, Geno. And, you do have a time pad in there, so it shouldn't hurt a thing.

CHALLENGER Yeah your big objective tomorrow is to get out and get back in, and the same thing with the next day. I don't think we're really that time critical either day that we can't go an hour either way. And, I think we'd prefer to have the full 8 tonight.

CAPCOM Roger. We couldn't agree with you more. And if there's anyway we can be of help to you now, just speak up.

CHALLENGER No, you've been doing fine. We just got a little housecleaning we got to do that's going to take us -- I expect we'll be an hour late, Joe.

END OF TAPE

PAO This is Apollo control at 127 hours 58 minutes. And the crew aboard Challenger on the lunar surface are now getting configured to begin their sleep period. Among the things in the checklist that they have done is to turn off the power amplifier which accounts for the somewhat noisier communications that we're getting. This is a normal presleep configuration and we don't expect to be communicating with the crew a great deal in the next hour and of course, none while they're in their sleep period. As you heard in the last exchange between capcom Joe Allen and Gene Cernan the crew will probably be getting the sleep period about one hour later than the flight plan calls for. At around 129 hours rather than the nominal flight plan time of 128 hours. We plan to allow them the full 8 hours for their rest period which means that they will be waking up just prior to 137 hours about 136 hours 55 minutes will be the wakeup time. And this would also slip the start of EVA-2 by about one hour giving us a start time for EVA-2 of 140 hours 10 minutes or about 5:03 p.m. central standard time. There is a one and a half hour pad following EVA-2 and EVA-3. This is identified in the flight plan as MCC conference and amounts to one and a half hours that can be used to make up loss time after the second EVA and third EVA. We would expect to make up the lost hour after the first EVA; however, if we are again running somewhat late after the second EVA rather and if we are running somewhat late after the second EVA we still have the hour and a half pad after the third EVA and would of course expect to be back on the nominal flight plan in time for an on time liftoff from the lunar surface. But, again based on the one hour late beginning of the sleep time and our plans to give the crew a full eight hours of sleep we would expect the EVA-2 to begin one hour late. At 140 hours 10 minutes or about 5:03 p.m. central standard time. We'll continue to leave the communication circuit PAO release line up live untill it appears Cernan and Schmitt have begun their sleep period of actually gone to sleep. We'll be reacquiring the command module in about 21 minutes. That vehicle now on it's 21st revolution around the Moon. And Ron Evans now about four hours into his scheduled eight hour sleep period. At 128 hours 2 minutes, this is Apollo control, Houston.

CHALLENGER Hey, Joe.

CAPCOM Go ahead.

CHALLENGER Some ambiguity in your - say did you want us to use a tissue or a towel on that visor cleaning.

CAPCOM Jack they call it - they call it a towel but it comes from the LM tissue dispenser, so I would interpret that to mean tissue.

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CHALLENGER Well, you and I are thinking alike, but
can you ask back there and find out.

CAPCOM Asking right now.

CAPCOM Jack, our guess was right on the cleaning
of the visor there. You're to use a tissue from the LM tissue
dispenser. And I've got an unrelated question for you. We're
tracing water usage down here. Could you tell us, please,
if you filled your drink dispenser - refilled the drink
dispensers in the suit already, over.

CHALLENGER That's affirm, we have.

CAPCOM Okay, thank you.

CHALLENGER We have been drinking quite a bit of
water, Joe.

CAPCOM Okay, thank you.

END OF TAPE

CERNAN We've been drinking quite a bit of water, Joe.
CAPCOM Okay, thank you.
CHALLENGER Houston, Challenger. How do you read?
CAPCOM You're loud and clear. Go ahead.
CHALLENGER Joe, I just took a quick look with the hand lens at that large rock I brought in. And, I don't think there's much more than 30 per cent plagioclase. I'll go back to, could be more of a standard basalt or gabbro. It has a fair proportion of elbonite in it I believe. There're some bright whitelets in the rock's vesicles of elbonite. Now it could be if the file is very glassy that it's developed the darker color from the contribution of the basic minerals to the glass, particularly the iron and the titanium.
CAPCOM Roger, Jack. Copy that. Sounds interesting.
CHALLENGER All it means is that we don't yet know the origin of the Dark Mantle.
CAPCOM Roger.
CHALLENGER That rock looks like I may, by accident, sampled the bunt side of one of the parting plains that I mentioned. Very, very sharply bounded on one side by a plainer surface.
CAPCOM Roger, Jack. Say again, you may have sampled by accident the side of what?
CHALLENGER No, I didn't, I mentioned when I sampled it had one very plainer surface and looking at it more closely, it looks like one of those parting plains that I talked about even earlier in the EVA.
CAPCOM Oh, Roger. Copy. Parting plains.
CHALLENGER Just like parting shot.
CAPCOM Of which, you've been known to have an over abundance by the way.
CHALLENGER Oh, I didn't know that.
CAPCOM All us (garble, garble, garble).
CHALLENGER That's right. They've got to figure out what range you're in though first JOe.
CAPCOM I'm sure that Sherlock Holmes would have a suitable quotation to answer that Jack. I just can't come up with it right now. Something like therein walks in life.
CHALLENGER That in itself is a singular event. But the dog did nothing in the night time Joe.
CAPCOM And when you've examined all possibility and eliminated all but the very improbable one, then the improbable one must mean the truth.
CHALLENGER I told you he was a good geologist. One of the experts on the soils of London. Not to mention their relationship to all kinds of brands of tobacco.
CAPCOM Jack maybe we'd better get off onto another vein. Surgeon's giving me a puzzled look over here. We may

CAPCOM be getting in trouble.
CHALLENGER You want to talk about veins, now that's something that old ore geologist could talk about all night.
CAPCOM Ore geologists and cardiologist alike.
CHALLENGER Thou strikest for the juggler.
CAPCOM Jack, we're running a contest down here to come up with a reply to that. We're getting a request, many requests for a weather report. We've been missing your weather report. We wonder what the weather is on the Moon right now.
CHALLENGER Well, the Moon's weather is fair and sunny. It's only scattered clouds, and all of those seem to be attached to the Earth.
CAPCOM Except for a cloud of dust around the right rear wheel of the Rover, we've noticed.
CHALLENGER Yes, but that dissipates in the morning warmth. Believe it or not, Joe, I'm going to be off the air briefly.
CAPCOM So far, I don't believe that.
CHALLENGER Well, if you don't get any heartbeat for a little while, don't worry.
CAPCOM Okay.

END OF TAPE

PAO This is Apollo Control at 128 hours 54 minutes. Gene Cernan and Jack Schmitt aboard Challenger on the lunar surface have turned off the voice subcarrier. We don't expect to hear from them any further. However, we do not believe at this time that they have begun their sleep period. Cernan reported about an hour ago that it didn't look as if would actually begin their sleep period until about 129 hours. So we expect that they are probably very close to beginning and will actually get to sleep within the next 10 or 15 minutes. Ron Evans aboard the Command Module crossed over the landing site some 10 or 15 minutes ago. America is now in it's 21st revolution of the Moon. And Evans has been sleeping soundly for nearly 5 hours. We do plan to let Cernan and Schmitt sleep a full 8 hours which means that they will be getting up about an hour later than the flight plan time which will also slip the start of EVA 2 by about 1 hour. Because of the noise on the air-to-ground line with the lunar module operating with it's power amplifier OFF which is the normal configuration for sleep period. We are going to take the relief line down. We'll record any conversation we get with the crew. Also, we would have a pretty good chance of getting the lines up in the event they plan to give us a call because we'll see the voice subcarrier come on first. But in any event either live or play-back we'll come up very shortly after any conversations with Challenger on the lunar surface or America in orbit around the Moon. At 128 hours and 56 minutes this is Apollo Control Houston.

END OF TAPE

PAO This is Apollo Control with 129 hours 30 minutes. About 28 minutes we had one brief transmission from Challenger on the lunar surface. Gene Cernan called to say that he and Jack Schmitt were beginning their sleep period and would see us in the morning which will be at a ground elapsed time of 136 hours 55 minutes. We plan to give them the full 8 hour sleep period called for in the flight plan. Also, Ron Evans, continuing to sleep soundly aboard the orbiting command service module America, completing it's 21st revolution of the Moon. And we're about to lose radio contact with the command module as it goes behind the Moon on that revolution. Both vehicles continuing to perform normally and good solid data from both the command and service module and the lunar module. Wakeup time for Evans aboard America is 131 hours 20 minutes. 31 minutes, this is Apollo Control Houston and we'll replay that very brief segment of tape from the lunar module Challenger.

CHALLENGER Joe, we're asleep. There's no need to answer. See you in the morning.

PAO And that was the full extent of the communications from Challenger. We do not expect to hear from them until 136 hours 55 minutes at which time we will be sending a wakeup call to them if they don't call us first. This is Mission Control Houston.

END OF TAPE

PAO This is Apollo Control at 131 hours 18 minutes into the mission of Apollo 17. From some 2 minutes away from wake up call to the Command Service Module Pilot, Ron Evans and about 13 minutes until the CSM goes behind the Moon on the 22nd - nearing the end of the 22nd lunar orbit. The lunar module is not scheduled to be called until about 136 hours 55 minutes, which is some 5 hours plus away from now. We're standing by here until the first call is made by spacecraft communicator. In this instance will be Gordon Fullerton. Presently the Apollo 17 command service module, America, is in an orbit measuring 69.6 an at pericyynthion by 53.5 nautical miles. Orbital velocity 5385 feet per second. Present altitude of 53.8 nautical miles above the surface of the Moon. Approaching the north-east quadrant of the Mare, Orientale. Continuing to stand by as we await the wake up call to Spacecraft America in lunar orbit. Let's just bring up the air-ground 2 line and leave it live for the first call.

CAPCOM Hello, America. This is Houston. Good morning, Sir.

SC America.

CAPCOM Hey, Ron, I heard some signs of life there.

SC Let's see. I got my duplex off there, so I won't talk to those guys on the surface.

CAPCOM That's a good idea. We don't want to wake them up. Ron, we're going to be going LOS here in about 3 minutes, just wanted to get you up. We're letting the LMies sleep over - sleep in an extra hour this morning. Over.

SC Oh, okay. I'll get my flightplan out here and see what I'm supposed to be doing. Well, probably just eating though I think, isn't it?

CAPCOM That's right. Get up and turn the VHF A off, change the canister and have breakfast.

SC Okay, sounds good. That's what I'll do.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/12/72 CST 08:21 GET 131:28 MC-510/1

PAO This is Apollo Control, we've had loss of signal from the Command Module America even though it was more of a mechanical reason for purposes of the network stations getting prepared for the next orbit they have dropped the uplink to the Command Service Module, America, with some 3 minutes remaining until the spacecraft actually disappears from electronic sight behind the Moon. Wake up times on the crew of Challenger ground elapsed of 136:55. New start time for EVA-2 140:10. America presently in a 53 point 5 by 69 point 9 nautical mile lunar orbit. Evans should have finished breakfast and tidied up the spacecraft by the time he reappears on revolution 23 some 48 or 9 minutes from now. And at 131:30 this is Apollo Control.

END OF TAPE

PAO This is Apollo Control at 132 hours 18 minutes ground elapsed time in the mission Apollo 17. Command Module America will reappear in the 23 revolution in about 38 seconds in which time there may or may not be some conversation between the spacecraft communicator, Gordon Fullerton and Command Module Pilot, Ron Evans. Evans, by now, should have completed his breakfast, change out of lithium hydroxide canisters in the spacecraft which scrub carbon dioxide from the atmosphere. Command Module America still in an orbit measuring 69 point 9 at apocynthion by 53 point 6 nautical mile pericynthion or close, closest approach to the surface. We have acquisition. Network always advises the flight director when the ground station has indeed locked up on the signal it takes a few seconds to get all of the lines squared away and the antenna pointed directly at the spacecraft. We'll bring up the air/ground 2 circuit at this time and eavesdrop on any conversation between the ground and Command Service Module, America. At 132:20 and standing by this is Apollo Control.

CAPCOM Hello there, America, how's breakfast this morning?
SC Hey, scrambled eggs and bacon, not bad at all.
CAPCOM Sounds better than what I had.
SC Yes, really, I'll bet. Want cocoa and orange juice a long with it? Even have 4 toasted bricks.
CAPCOM Very good.
SC Hey, Gordo, do you have any sort of - kind of ground truth wrapup of the EVA as far as the type of material they ran across down there and things like that?
CAPCOM Ron, I'm kinda personally on and off. Let me work on it, get a summary and I'll come back to you on that.
SC Okay, nothing elebrate but just a - you know -
CAPCOM Okay, talking about the America, though, your consumables, you're 3 point 8 per cent high on RCS quantity. On the 0 2 - well, all the points of the 3 tanks are falling between the 2 sets of lines on your graphs with a total results as on 0 2, you're about 10 pounds below the average quantity expected, however, your trend is paralleling in the lines and that's of absolutely no concern. On hydrogen, my best guess is you're probably a little bit high total. Your tank 1 is right on the line, tank 2 is, oh, about 6 or 7 percent high and tank 3 is about 4 percent high, so you're fat on hydrogen. Over.
SC It doesn't sound to bad then, does it.
CAPCOM No, it sounds great.
SC Sounds good, I think.

END OF TAPE

SC Houston, America. I can give you a (garbled).
CAPCOM Okay, Ron, go ahead.
SC Okay, PRD is - (garbled) is cut out on me.
My orange juice is leaking. Okay, PRD is 15038 and about 6 hours
of good sleep. Took me about an hour to get things squared away
then I woke up early this morning. Didn't take any medication,
and I had 4 cans of fluid.

CAPCOM Okay.
SC Okay, on the menu, did I give you day 5
meal I ate yesterday or not?

CAPCOM I guess you did not.
SC Okay. Spiced oat cereal, sausage patties,
instant breakfast, coffee, and a half an ambrosia. Okay, 4
frankfurters, ate the pears, chocolate pudding, grape drink, and
in addition I had a grape punch, package of brownies, package of
graham crackers, and 2 gingerbreads. For the bottom one there
turkey and gravy, orange beverage, if I can find my chocolate bar,
I'm going to eat it today, because I didn't eat it yet. Oh, and
I had the vitamins yesterday too.

CAPCOM Okay, Ron. Ron, If you'd like I could give
you a summary of the EVA-1 - just sort of edit a report put out
by the back room on that.

SC Yeah, go ahead, Joe. Appreciate it.

CAPCOM Okay. I'll read it to you - selected excerpts
here. The surface around the landing site is generally an undulating
plain which was somewhat rougher and had a greater abundance of blocks
than was expected by the astronauts. It is saturated with small craters
not exceeding a few centimeters in size, but not with larger
craters. Small craters commonly have glass on their floors.
Boulders ranging from about a half a meter to 4 meters are common.
All of them are partially buried or filled with the dust of the
dark mantle. In one locality a crater about 1 meter deep penetrated
the relatively fine dark surface material, and excavated small blocks,
other shallower craters in this area do not fully penetrate the
mantle. This fact together with the abundance of small boulders
on or near the surface indicate that the dark mantle is relatively
thin. A minor amount of dust noticed upon landing, suggested a
thin layer of fine grain unconsolidated material. Footprints and
LRV tracks left firm impressions in the fine grain material when
darker material was kicked up from underneath. At the ALSEP site,
the drill encountered other materials several times and definitely
seemed to reach harder material at about a 7 foot depths. The
deep drill core apparently also bottomed in harder material. In
the core the material was noted to be cohesive and it contained
more fragments than did the surfacial material. The dominant
rock type between the LM and Steno Crater, is medium grained,
vesicular or nonvesicular basalt or gabbro. It contains about
equal amounts of plagioclase and peroxine along with less abundance

CAPCOM opaque material. The guys took a total of well, they took a lot of pictures. I had 229 color and 197 black and white during EVA-1. And they got 17 samples in addition to the deep drill core. 3 were large unbagged rocks, and the total splitting the core estimated to weigh about 13 kilograms so far and they traveled about 3 kilometers in the Rover. As a summary conclusion, the observations made on the first EVA support the premission interpretation that at least the upper part of the subfloor materials consist of the basaltic lava flow. The overlying dark mantle may be part of the regular on-subfloor material but the possibility that it is an independant unit, remains open and will be tested by observations on second and third EVA's. Both dark mantle and upper subfloor units, contain remarkably little foreign material between the ALSEP site and Steno, which suggests comparatively young ages. Over.

SC Hey, that sounds like a good report there. They - sounds like they got a lot of stuff to edit. Also getting very good information out of it already.

CAPCOM Yeah, I think that's a safe conclusion. Going to get a lot more today.

SC Oh, you bet.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/12/72 GET 132:37 CST 0930 MC 513/1

CAPCOM Ron, for your information, the ALSEP seems to be working pretty well at the central station and all experiments with the exception of one, are working normally. The one that's giving them trouble is the LEAM and the data on the LEAM doesn't seem to want to sync up properly. They're thinking that one over and maybe will have something for them to try to get that to work right. Over.

EVANS Oh, okay, mighty fine.

END OF TAPE

CAPCOM America, Houston. I have a couple of update flight plans to give you. We suggest you take them down before you start the P52, at your convenience. Just so we don't interrupt your preparations for the zodiacal light.

AMERICA Okay. Got (garble) inspection of the camera, finally. Something about the zero G, it kind of pulls that crazy little cassette back out of the way again. I had a heck of a time getting the lid closed on that.

CAPCOM Roger.

AMERICA Okay, ready for the update.

CAPCOM Okay, your key star time for zodiacal light goes in there at 133:25 is 133:28:03.

AMERICA Key star 133:28:03.

CAPCOM That's correct, and then flip the page over to 134:35.

AMERICA Okay.

CAPCOM And write in charge battery A.

AMERICA Charge BAT A at 134:35.

CAPCOM Affirmative. At the bottom of the same column, at 134:54, delete mapping camera retract, and also a couple of lines later, delete mapping camera laser altimeter cover closed.

AMERICA Okay, we deleted the retraction of mapping camera and also deleted covering - closing the mapping camera laser altimeter.

CAPCOM That's affirmative. Above that whole sequence, we have some verifies for you. You can write this in about 134:50. Actually, you'd better start a little higher to have room.

AMERICA Okay.

CAPCOM Verify all VHF off for sounder path and here are the steps. VHM AM A and B OFF. VHF AM Receive Only OFF. VHF Beacon OFF and VHF Ranging OFF. Four steps there, by the way.

AMERICA Okay. We just verify that all VHF is off for sounder operations. VHF A and B OFF, Receive OFF, Receive Only OFF, Beacon Off and Ranging Off.

CAPCOM Okay. That's all I've got.

AMERICA Ranging's Off, Beacon has been Off, Receive Only is OFF - Okay.
END OF TAPE

AMERICA They're going to love the fidelity of
my transmissions with the way I've got the microphones set now.
CAPCOM Okay, Ron. You sound pretty good to me.
AMERICA Okay, I don't have this comm carrier on
very tight. I just wanted to make sure I was still coming
through all right.
CAPCOM Yeah, I think it's perfectly adequate.
AMERICA Okay.
CAPCOM Ron, we'd like high gain to auto.
AMERICA High gain to auto. Have it.
CAPCOM Thank you.
CAPCOM Looks like another good one, Ron.
AMERICA Okay.
CAPCOM Those are good - talk 'em up.
AMERICA I took that at 133 01.
CAPCOM Okay.
CAPCOM America, Houston. Give us ACCEPT and
we'll give you a vector.
AMERICA Okay, you have ACCEPT.

END OF TAPE

CAPCOM America, Houston, it's your computer
now.
AMERICA Okay, (garble)
AMERICA Okay, running inable jets - - Charlie 3 and Dog 3,
disenable Bravo 3 and Alpha 3.
CAPCOM Okay, Ron. Ron, just for general
information, on your platform drift range, it's not to bad.
X is minus point 007 degrees per hour and Y plus point 002
and Z is really hard to believe, it's a minus point 0003
degrees per hour.
AMERICA Ah ha, that's beautiful.
CAPCOM That's gotta be some kind of record.
AMERICA Oh, I guess.
CAPCOM We may just cancel all further P52s.
AMERICA (laughter) Yeah, they're kind of easy
here in lunar orbit. All except that one that I didn't
get done on time yesterday. By the time I got around to
doing it I was pointing right at the Moon, bowl and ditch,
it was daylight and I couldn't see any stars and finally
got the right attitude so that pick a pair would work.
CAPCOM Rog.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/12/72 10:10CST 133:17GET MC-517/1

AMERICA Well, Gordo, it looks like I'll lose you right in the middle of this zodiacal light sequencer.

CAPCOM That's right. We aren't going to be able to be much help. I'll give you a little warning before T start. But you're on you own after that, I guess.

AMERICA (laughter) Okay.

END OF TAPE

CAPCOM Ron, you have about 30 seconds now until
T start.

AMERICA Ah, hah, okay. 2803 we'll start the clock.

CAPCOM That's some. Ron, it's about time - coming
up on time to start the 90 second explosion.

AMERICA Okay.

CAPCOM Coming up on time to close the shutter
now.

AMERICA Okay.

CAPCOM Okay, America, we're just about LOS. I'll
see you on the other side.

AMERICA Okay, Gordo, thank you much.

PAO And we've had loss of signal as Apollo 17
command service module America coasted behind the Moon nearing
the end of the 23rd lunar orbit. Present orbit measurements
53.5 nautical mile pericyynthion by 69.6 apicynthion. Velocity
at LOS was 5 365 feet per second. Ron Evans and spacecraft
America will come back around on the 24th lunar orbit in
approximately 48 minutes. The crew of Challenger, meanwhile,
at Taurus-Littrow, are still asleep at this time. Wakeup
time is now scheduled at ground elapsed time of 136:55, slightly
over 3 hours from now and the new start time for EVA 2, as
mentioned earlier, is ground elapsed time of 140 hours
10 minutes, and at 133 hours 33 minutes ground elapsed time,
this is Apollo Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/12/72 10:34CST 133:41GET MC-519/1

PAO This is Apollo Control. A briefing on the modular integrated utility system - MIUS - sponsored by the American Institute of Aeronautics and Astronautics will take place momentarily in the small briefing room in the Building 1 news center. Still some 3 hours away from crew wake up, the surface crew, that is, of Cernan and Schmitt aboard the Lunar Module, Challenger - asleep at this time at Taurus-Littrow landing site. At 133:42 a reminder to news men of the briefing on the utility system program starting momentarily. This is Apollo Control.

END OF TAPE

PAO This is Apollo Control at 134 hours 16 minutes, ground elapsed time. Less than a minute now until Ron Evans aboard Spacecraft America appears on the front side of the Moon. The 24th revolution. We'll monitor any conversation between the ground and Evans during this front side pass, which lasts slightly over an hour. Evans at this time, conducting some of the orbital science and photography experiments and tasks. Waiting for the word from the network controller that the spacecraft has been acquired by the ground station. To repeat the earlier times for the day's activities with the crew of the Lunar Module Challenger, they will be awakened at ground elapsed time of 136 55. The start of EVA-2 is now scheduled at 140 10. We should have acquisition now. We're waiting for the antennas to settle down, spacecraft to get solid lockon. The static is dropped off considerably. We'll stand by while CAPCOM makes his call.

CAPCOM Hello, America.

SC Okay, you got America here. The dark light sequence worked real well. Oddly enough I ended up right. On the right setting with the right time and everything the only thing is on the 8 minute - on the 8 minute picture, for some reason I didn't notice that the shutter shut as soon as I took it instead of 60 seconds later so we just missed that picture altogether.

CAPCOM Okay, Ron, understand.

SC But the timing worked out good. It was about 2 seconds after the 1450 sequence - no 2 seconds - no 1 second after the 1450 sequence, and the sun came up.

CAPCOM Okay.

SC It's going to be hard to - to determine any real relief around the vicinity of Sangor right in there, because it's right at the 0 facepoint now.

CAPCOM Roger.

CAPCOM Ron, I have some words on what we've been seeing in the sounder and optical recorders when you get a free moment.

SC Okay. I'm just kind of looking out the window now, go ahead.

CAPCOM Okay. According to our rather crude readout on the film remaining is - looks like we're using more film than we should be, and the recorder and it's - if you add up the amount of film used according to that telemetry, compared to sometimes when the recorder has been ON and also at STANDBY. It looks like there's a possibility they jibed to show we might be pulling film through the recorder in - while we're in STANDBY. This is unlikely because it takes a couple of failures that we don't think there really likely at all but we're going to try to run a little test at 134 50 during that sequence of getting set up for the VHF sounder pass. It'll just involve a couple of switch throwing

APOLLO 17 MISSION COMMENTARY 12/12/72 GET 134:16 CST 11:09 MC 520/2

CAPCOM by you to try to conclusively prove that this
is not the case. Over.

SC Oh, okay, mighty fine. Sure when you get to
it there, just holler out the switches because I'll be over at the
panel at that time.

CAPCOM Okay.

SC I kind of hope our telemetry is wrong.

END OF TAPE

SC Let's go to the - pan camera power
on there.

CAPCOM Okay, we're ready.

SC Okay, boys, stand by, pan camera power's
coming on.

SC You know, Houston, just west of (garble)
and on the edge of -

CAPCOM We need the pan camera OFF now and -

SC Oh, okay, pan camera is OFF.

CAPCOM Roger, go ahead.

SC But you get the same verticle - you
get the same verticle streaking that we do on the edge of
Serenitatis off the Massif units.

CAPCOM Roger.

SC Going up on the card now, looking at it
a little bit from a distance, there's a darker albedo that
goes out about about a half a crater diameter from it and
then on top of that darker albedo it only goes out maybe
a fourth of a crater in diameter is a lighter type material
that seems to be covering it up. The lighter type material,
though, only goes in a generally westerly - well up from the
south around to the west side and kind of from the northeast
around to the northwest side and it leaves the dark material
draping down in the side of Bicart, on the east side of
Bicart.

CAPCOM Roger.

SC It looks like it's fairly easy to,
when you go around from the south to the west side it has
a light material on it. You can pretty well carry a light
layer in the top portion of the wall all the way around to
that part where it stops, where the light part stops. And
then you come to a dark layer again and then as you continue
around from the west going around to the north side. It's
a little bit shadowed on the east side so I can't tell for
sure if that light layer is in there or not but starting on
the south side going around to the west again you can see
a layer of dark, dark material, although there doesn't
seem to be a change in the slope or the interwall of the
crater.

CAPCOM Okay.

SC And then just below - just below the
dark layer, again a change in slope a little bit, it's more
of a gradual slope, it goes on down to essentially maintain
that slope throughout the - all the way down to the crater
floor, where you get into the slope blocks and then in the
center of the crater it looks like a maria type fill with -
hey, I'm about to lose sight of it again - but, with some-
thing comparable to a central peak in it. I ought to get
the rest of that a little bit later on.

CAPCOM Rog.

SC You know, right west of, I think it's Yerkees or Yerks or whatever it is, between there and Frakalas, there's a real small crater, I'm looking at it with the binocks, and the reason it stands out is because it's a fresh crater and yet it's a dark, dark halo all the way around it.

CAPCOM Roger.

SC And it's also dark down on the inside of it. I still don't have a feeling for the relative size of things. I'll try to get that one in the next pass around through, but that's what I would call a small, maybe even in the thousand meter barcket probably, some where in there.

CAPCOM Roger, Ron.

SC Am I supposed to charge battery A here some where.

CAPCOM That's affirm, when you've got a chance and also you're due to turn some switches on panel 230.

SC Okay. Let's see, battery vent valve was still in vent and we're not tying together -

END OF TAPE

AMERICA On vent, and we're not tied together. Bat relay bus to Bat A is out. Okay, got 32 volts, let's go to bat charger at A. Up two and a half 2.2 and a quarter Amp.

CAPCOM Okay.

AMERICA And 34 volts on the charge. Okay, just where it gets interesting, though, I thought I had to go to 2:30, huh?

CAPCOM Right.

AMERICA Okay, let's - do you want to get that lunar sounder stuff now? Sounder on standby? Recorder is on. Radar is on. Recorder is off. Mode went to VHF.

CAPCOM Okay, sounds good.

AMERICA And all the VH - all the VH switch - VHF AM switches are verified off.

CAPCOM Oh, and I've got one more update for the flight plan unless there's something interesting out the window. There's no hurry on that update.

AMERICA Okay, let me take another look at the landing site then I'll get it, okay?

CAPCOM Okay, fine.

AMERICA Okay, the sun's getting a little bit higher now and as I look at the landing site, the albedo - differences in the color in there, the color in the Maraldi (garble) is the same as in the landing site itself and also looks like the type of material that we say is - especially covering that whole area. It goes on out to and includes the annulus of Serenitatis.

CAPCOM Roger.

AMERICA Let's see, did I mention that it looks like the flow out of Maraldi has gone on around it down to and almost encroaches on the Vitruvius A that has breached out of the side of Maraldi, gone around that depression there and up to the side of Vitruvius A.

CAPCOM Roger, Ron.

AMERICA You still get that same bluish - bluish type tint from the area in the landing site. At station number 2 in the landslide, it's going to be a pretty good - pretty good little depression there. The scarp itself - it looked like they picked the least slope - portion to go up it, and that's kinda between Lara - I think Lara's the one, right - the crater just to the - west of the scarp.

CAPCOM Roger. I haven't been on all your revs, Have you ever had any - anything you call a visual on the left?

AMERICA No, I really haven't looked that much, Gordo. See my optics were always pointing up in the air, so I can't use the sextant. The binox - I'm having a heck of a time holding them still enough to concentrate on anything very small.

CAPCOM Roger.

AMERICA You know, when you come around the dark annulus falling around by Menelaus and Tacquet and then it kinda seems to change color a little bit when you get up to a Sulpicius Gallus.

APOLLO 17 MISSION COMMENTARY 12/12/72 GET 134:37 CST 1130 MC 522/2

CAPCOM Roger.

AMERICA I guess the only thing you can say is that the southern part in there - the Tacquet region, has more of a bluish tint and that to me this has more of a brownish tint to it when you get up in the Sulpicius Gallus region.

CAPCOM Rog.

AMERICA Hey, wait a minute, I'm just now passing Menelaus now. So, it changes color right at the Tacquet and then, at about Tacquet and Menelaus, and Sulpicius Gallus is just now coming up. You know, I think sun angle has a heck of a lot to do with the fact because this whole thing of the Sulpicius Gallus region looks kind of brownish to me.

CAPCOM Okay.

END OF TAPE

CAPCOM Okay.
AMERICA We'll have to check that when the sun gets a little bit higher as we come across there again.
CAPCOM Roger.
AMERICA Okay, Gordo, I guess I'd better get some work done here.
CAPCOM Okay, I want you to go through all those switches as shown on the flight plan and when you finish all of those with SMC power off I have a couple of more for you.
AMERICA Okay. Forgot to turn the lights on in there though. I can't see in the dark. Okay, mapping camera - is that the right time - let's see - 49? Oh, wait just a second on the mapping camera there. It takes good terminator pictures too, doesn't it?
CAPCOM Ron, go ahead and turn the mapping camera off. Just a minute or two ago it started acting up. We'll turn it off now and troubleshoot it later.
AMERICA Oh, okay. Mapping camera's off right now. Take 30 seconds. - Okay, mapping camera is standby, image motion is off - Okay, there we go, standby - Now, image motion is off, got a barber pole grid, in grey, okay? Now, mapping camera to off, laser altimeter to off, - Okay, want the recorder to on, huh? All right, IR's going off and camera's off test, going off -
CAPCOM Wait until sunset on the next one.
AMERICA And the old - Okay. I can really tell sunset because the EVA pole sticks out here by window 5. It looks like it's lit up now the way the sun's shining on it.
CAPCOM Rog.
AMERICA Hey, Gordo, how good is that vox? Could you hear me chewing?
CAPCOM No, I can't hear you chewing. Hear you talking fine.
AMERICA Okay, that's good then.
AMERICA That has to be sunset.
CAPCOM It's about the right time.
AMERICA Okay. V is off and I'm going to close the IR cover, barber pole grey EV cover, barber pole and grey. - Okay, I'll turn the old flag power off.
CAPCOM Okay, Ron. Now we want lunar sounder operate switch to operate.
AMERICA Okay, let's go to operate - ah - now.
CAPCOM What we're doing this for is to get a readout of the film quantity.
AMERICA Oh, I see.
CAPCOM Okay, we've got it and you can go back to your lunar sounder operate switch to standby now.

END OF TAPE

CAPCOM Stand by now.
AMERICA Okay, lunar sounder is in stand by.
CAPCOM Okay, that completes that test. Have a couple
of additions to the flight plan for 13635 is the first one.
AMERICA Okay, I'm here.
CAPCOM Okay, 13635 add VERB 48; perenthesis 11102;
perenthesis 01111.
AMERICA Okay, at 13635, VERB 48; 2, 1102 and 01111.
CAPCOM Okay, the first one is 3 ones 02.
AMERICA Okay, 3 ones 02, and a 0 4 ones.
CAPCOM Right. And what we're doing here is making
a 20 degree roll by keeping P20 going to allow the CAL the VHF,
I guess they had some unexpected noise on the VHF center and they
want to slip this in as a another check on it. So the next step
is 13644, and at that time put in VERB 22, NOUN 78, perenthesis plus
072.24 perenthesis. Then VERB 58 ENTER then some words when
maneuver complete wait 20 seconds. Then a VERB 22, NOUN 78,
perenthesis plus 052.25 perenthesis. That's a plus 052.25. And
follow that with a VERB 58 ENTER. And then one more line, you
still with me?
AMERICA Yep, still with you, Gus.
CAPCOM Okay, at 13647, write in VERB 48, and we go
back to perenthesis 11101 and 0 and 41.
AMERICA Okay. At 44 we VERB 22978 then change it to
72.24 degrees and VERB 58. Okay, and then we're going to stay
in that attitude for 20 seconds. Then change it back to plus
X, forward SIM bay attitude again. Then as soon as we get back we'll
change our DAP back to 2 tenths of a degree per second.
CAPCOM That's right, and what this will do is stick
the VHF antenna right straight down on Nadir for CAL.
AMERICA Oh, okay.
CAPCOM At your convenience, we need AUTO on the high
gain.
AMERICA You have AUTO. Pretty convenient when your
laying in the center couch. (chuckle).
CAPCOM Ron, I got the morning news if you understood
and I can watch the clock there for the data system on-time, or
off-time rather.
AMERICA Okay, sure, go ahead.
CAPCOM Okay,
AMERICA I'm setting up the camera.
CAPCOM Front pages around the country are headlining
last night's EVA as you might expect, with photographs taken from
TV monitors showing Cernan and Schmitt doing their tasks. And
by the way, their TV camera is spectacularly clear and sharp.
It's almost like regular studio TV. In other news, South Viet
Nam's President Thieu is
AMERICA Outstanding.
CAPCOM suggested all prisoners of war be released
before Christmas. He's also asked that all Vietnamese parties

APOLLO 17 MISSION COMMENTARY 12/12/72 GET 134:57 CST 11:50 MC 524/2

CAPCOM be included in peace negotiations. South Viet Nam and the Viet Cong are not directly represented in the secret talks now under way in Paris. Meanwhile, Henry Kissinger met for more than 4 hours yesterday with Hanoi representatives Le Duc Tho. The two negotiators are expected to meet again this afternoon. Former President Harry Truman is still resting quietly although his condition remains serious according to his doctors. American poet Mark Van Doren died at the age of 78. He was a professor of literature in Columbia, and the winner of the 1940 Pulitzer Prize for his poetry. President Nixon announced yesterday he wants to extend wage-price control beyond the scheduled April 30 expiration. He also plans to freeze new hiring promotions for pay increases for executives of the Federal Government. Guess that doesn't include us. The Republican National Committee -

AMERICA I don't think it does either.

CAPCOM a new chairman, George Bush of Houston, who is ambassador now - now ambassador of the United Nations. He will continue his UN post through the present session of the General Assembly. Both national political parties are now headed by Texans. I think we mentioned to you Robert Straus of Dallas became chairman of the Democratic national committee last Saturday. And when you see Jack again, you can him he's been replaced by the Nimbus Flying Weather Satellite, which is operat ---

END OF TAPE

CAPCOM This one-eyed weather satellite which is operating in orbit after being launched from Vandenburg very early Monday morning.

AMERICA (chuckle) Outstanding.

CAPCOM Ah - Joe Namath, I think you might have heard the football score last night, the Oakland Raiders got to Namath and the Jets in the 4th quarter and beat them 24 to 16. Namath passed for more than 400 yards but only scored 1 touchdown. And the Houston weather, we've had two kinds of weather since you've left. It's been either cold and rainy or chilly and rainy and it's foggy and drizzly here again today -

AMERICA (chuckle)

CAPCOM and temperatures are expected to rise to the mid-forties and go down to a low of 32 tonight. There you have it.

AMERICA Gee whiz - hey, thank you.

CAPCOM Any time.

CAPCOM We need to get to the data system switch and turn on the sounder at - in about a minute.

AMERICA Okay. - Okay, data system is off. 58, 59 oops - mark it. Okay, went to operate.

CAPCOM Okay.

AMERICA All the talk-backs are still grey.

CAPCOM Roger.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/12/72 CST 12:10 GET 135:17 MC-526/1

CAPCOM America, Houston, about 3 minutes to LOS, spacecraft looks good and the sounder is still on the Moon with RF energy just the way it's supposed to, over.

SC Hey, outstanding. Trying to consolidate all of my trash. Didn't realize you had so much junk.

CAPCOM Roger.

PAO This is Apollo Control. We've had loss of signal as the spacecraft America coasted behind the Moon nearing the end of the 24th lunar orbit. Some 47 or 48 minutes before the spacecraft reappears again on revolution 25. Current orbital measurements for Command Service Module America, 69 point 7 by 53 point 5 nautical miles. Currently Command Module Pilot, Ron Evans, is doing a bit of house-keeping, said he was consolidating his trash. Also, he was passed the word just before LOS that the lunar sounder experiment which previously had been acting up a little bit is now feeding constant good data and working properly. However, there seems to be some apparent problem in the mapping camera which the people on the ground will discuss and come up with a troubleshooting procedure. They're not too certain, yet, just what the nature of the problem is. That will be reported as soon as some determination is made. 1 hour and 22 minutes until wakeup of the Challenger crew. And at 135:33 ground elapsed time, this is Apollo Control.

END OF TAPE

PAO This is Apollo Control at 136 hours
15 minutes ground elapsed time, less than a minute away from
acquisition of the command module America, coming around on
revolution number 25 and 39 minutes approximately until the
wakeup call to the crew of Challenger on the lunar
surface, still asleep at this time apparently. The commander
in the upper berth, and the lunar module pilot in the lower
berth. Prior to the time the wakeup call is made, we will
drop the Air/Ground 2 circuit carrying the command module
pilot conversation and go to the Air/Ground 1 with the
surface crew and their preparations for the second EVA which
will start about an hour later than the premission flight
plan. We have notification from the network controller that
we have acquisition of the command module downlink. A visitor
today in the Control Room is General James McDevitt, former
Apollo spacecraft office program manager here at the Manned
Spacecraft Center, now with a utility company in Michigan.
We will stand by now for the initial call to the command module
on this revolution.

CAPCOM Houston, over.

AMERICA Hello Houston, this is America, loud and

clear.

CAPCOM You, too.

END OF TAPE

AMERICA Houston, America. Magazine Lema Lema will be starting with frame 54.

CAPCOM Okay, we copy that, Ron. The sounder still looks good, clicking right away and - the mapping camera is funny I mentioned earlier. We haven't nailed down exactly it is. Most likely we think it's an instrumentation erroneous indication and so we're going to continue with a normal schedule of activities in the mapping camera except, of course, for the deploy and retraction.

AMERICA Uh, huh - okay. Well, let's hope that's what it is then.

CAPCOM Let's.

AMERICA I'll have to change that. I'm starting at frame 55 instead of 54. I just took a picture of the crater on the - well, I guess southwest of Krisha(?).

CAPCOM Okay, Ron.

AMERICA It's got a light color - light colored dike or something through the central peak in the bottom of the small crater. The crater's about - oh - 30 to 50 kilometers, I guess, in diameter. There's a small crater west of Condoreet.

CAPCOM Okay.

AMERICA Another crater appears - it's got that same dark halo around it's crater and it extends out to - again you can see it real well out to about a half a crater diameter. You don't see any of the light colored except on top of it though like you do on the colored.

CAPCOM Okay.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/12/72 13:30 CST 136:37 GET MC529/1

AMERICA Boy, that scarp sure looks like a flow
battery to me.
CAPCOM Rog. On the landing site scarp.
AMERICA Yeah.
AMERICA I don't know how you get it to go up
the North Massif but it sure looks like it runs that way.
Just from the shadows and everything.
AMERICA Gordo, does this go all the way out to
Bessel? Across the Anulus ridge there?
CAPCOM It doesn't go all the way to Bessel. It
stops up short of Bessel about half way across Serenity from
the Taurus-Littrow to Bessel.
AMERICA Okay. I forgot to look where it stopped.
AMERICA They ended up on frame 92.
CAPCOM Okay, we copy that. Frame 92.
CAPCOM Okay, Ron, high-gain to AUTO when you
get a chance.
AMERICA Okay. There's 20 seconds or so.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/12/72 13:40CST 136:47GET MC530/1

PAO This is Apollo Control at 136:54 GET.
We have now shifted over to air-ground 1 for the first
wake-up call to the crew of Challenger at the landing site,
Taurus-Littrow. We have dropped the command service module
circuit air-ground 2. Live and listening on the lunar
module circuit at 136:54 this is Apollo Control.

CAPCOM Music ... Good morning, Challenger.

CHALLENGER Sounded like Parker has the duty. Both
monumental and epic.

CAPCOM Jack, that's suppose to take you back
to Cal Tech's final's week.

CHALLENGER (Schmitt humming the Funeral March)

END OF TAPE

CHALLENGER How does everything look, Gordie?
CAPCOM Couldn't look better, how's it look to
you?
CHALLENGER Well, it's nice to have rested so -
CAPCOM Roger, I'm sure of that.
CHALLENGER How do our consummables look today?
CAPCOM They look good as expected, right on.
PAO This is Apollo Control. The wakeup music
this morning for Challenger was the "Ride of Valkyries" from
Richard Wagoner's Opera Die Walkure. Apparantly, Jack Schmitt,
when he was at Cal Tech had his roommates sitting bolt upright
in bed in the morning by playing this on the stereo system,
and this was the appropriate choice of music for waking him
up this morning. Thirty minutes from -
CHALLENGER Stowing your sleep restraint up there?
CHALLENGER I mean your hammock.
CHALLENGER Either way, I'll stuff mine - I'll stuff
all of mine into this compartment here, if you're going to get
yours, otherwise we could rearrange it. See how it looks first.
CHALLENGER (garble)
CHALLENGER Gordie, you guys held comm pretty well
last night, and I only remember one break.
CAPCOM Roger, Jack.
CHALLENGER Take you off biomed for a minute.
CHALLENGER (garbled)
CHALLENGER Well, how about it Gordie, are we stay
or no stay for EVA 2 prep?
CAPCOM You're stay, never any doubt.
CHALLENGER Thank you sir.
CHALLENGER Did you have any medication?
CHALLENGER I already reported the food. Hey, Gordie,
status report is excellent, no medication for either one of
us. CDR slept 6 hours pretty good, I slept 6 hours inter-
mittent, but generally good.
CAPCOM Okay, Jack.
CHALLENGER And we've eaten well, I think. The food
is a little bit confused since we had our little minor ex-
plosion in the cabin, but I think you could say it's good -
we've had a lot to drink - a lot of juices, we ate the frank-
furters. We're sharing a lot of the stuff cause it's not
symmetrically packed. If you want more details it will take
time.

END OF TAPE

APOLLO 17 MISSION COMMENTARY, 12/12/72, 14:00CST, 137:07GET, 532/1

CHALLENGER And Gordy we did not eat the corn chowder.
CAPCOM Okay, Roger you did not eat the corn chowder.
But most everything else on the menu, is that right?

CHALLENGER Yeah we got just about everything else.
We got into maybe fixed up through 2 meals but essentially
Meal B and C for yesterday were eaten except for the corn
chowder.

CAPCOM Okay, Jack. We're wondering if you could
come up with a quantitative estimate on water you've each
drunk and also your PRD readings.

CHALLENGER Stand by Gordy. That may be difficult.
Yeah, we'll get the PRD a little bit later when we start suit-
ing up.

CAPCOM Yeah, okay. That'll be fine.

CHALLENGER Hey Gordy, I'm in water. We saturated our-
selves before we went out. I finished my drink bag out in the
suit on the surface. Jack finished about better than three
quarters of his. We've had water in tea and in the juice and
we have been drinking water constantly post-EVA, and to give
you a quantity it's almost impossible.

CAPCOM Okay, that's fine.

CHALLENGER If the water is down it's probably because
we've been drinking it. And I'm ready for your lift-off pad
data.

CAPCOM Okay, for REV 26 liftoff time is 138 40 15.
27 is 140 38 49. 142 37 22, 144, 35, 55, 146 34 29, 148 33 03.
And the last one REV 32 is 150 31 37. Go ahead.

CHALLENGER Okay, REV 26 - is that the first one, Gordy?

CAPCOM That's affirm.

CHALLENGER Okay, REV 26 is 138 40 15; 140 38 49; 142
37 22, 144 35 55, 146 34 29, 148 33 03; 150 31 37. And what's
our present REV?

CAPCOM Okay, I'll have to check that myself. We're
on REV 25, he's about three-quarters away across the Sun side.
Coming up backside will start at 26. And for your information,
he's running a VHF sounder and it's working fine.

CHALLENGER That's good to hear. By the way, good morn-
ing Gordy.

CAPCOM Good morning Commander.

CHALLENGER How does America, itself look?

CAPCOM Just as good as ever. I had on the con-
summables no problem on the spacecraft systems - only minor
funnies in the SIMBAY but even it is almost 100 percent.

CHALLENGER Okay, and I guess - I didn't hear your
comment but I guess Challenger is the same way.

CAPCOM That's affirm. That's the way it looks
here, any way.

CAPCOM Challenger, Houston. We've been working
while you've been sleeping on a fix for the missing fender.

APOLLO 17 MISSION COMMENTARY, 12/12/72, 14:00CST, 137:07CST, 532/2

John Young has been over working it out in his suit in the mock up rover and we have about probably 5 to 10 minutes worth of words. And how do you want to go about that whenever you have that much time to listen. It'll be mostly listening on your part - let us know.

CHALLENGER Okay, Gordy will do.

CHALLENGER Nope - well, I did but GARBLE.

CHALLENGER GARBLE.

CHALLENGER GARBLE.

CHALLENGER Gordy, you've implied that we may be a little behind on water, is that correct?

CAPCOM No, that's not the problem, Jack. I think our concern was more that you were taking that from GARBLE onboard internally.

CHALLENGER Our water.

CAPCOM That's right - you were drinking enough - that's what we were worried about.

CHALLENGER Okay, we'll keep pushing it.

CHALLENGER GARBLE

END OF TAPE

CHALLENGER Oh a -
CHALLENGER Cold scrambled eggs.
CHALLENGER (garble)
CHALLENGER Gordy we're going to start to eat here, why don't you talk to us about that fender?
CAPCOM Okay, let me round up John Young, he stepped out for a second. We'll have him here in a minute. Might as well let the resident expert on fenders talk.

CAPCOM Okay, I'll now turn the microphone over to Captain Young.

CAPCOM Hey, Geno this is John. We spent -

CHALLENGER Hello John, how you doing?

CAPCOM Oh just fine, you guys are doing a superb job, really beautiful. Hey we spent some time on this fender problem and worked out a pretty simple minded procedure which involves essentially taking 4 of those chronopaque pages out of your lunar surface map, ones which are not going to be used for discussing the site, taping them together with grey tape so that you end up with a piece of paper about 15 inches by 10 1/2 inches and then using the AOT clamps prepositioned pull opened, taking them out and taking that piece of paper out laying it on top of the fender guide rails and clamping the edges of it with the AOT lamp clamps. It's simple straight forward and the beauty of it you're only spending about 2 minutes in the clamping operation and it could save you up to about 12 dusting I think maybe. What do you think?

CHALLENGER Yeah, John, I think we ought to try something because, you told me, but I guess you can't appreciate it until you see it happen yourself. That dust without that fender is just almost unacceptable it - This sounds pretty good, how do you want those things taped together?

CAPCOM You just take 4 pages and allow, well I've got the detailed procedures here if you're ready to copy, over.

CHALLENGER Well, I'm not ready to copy yet, but what do you do, tape 4 squares into a bigger square about 16 by 20.

CAPCOM Yeah, allow about an inch of overlap and tape both sides of them.

CHALLENGER Okay.

CAPCOM And then you get the AOT clamps off the utility light and open the clamp jaws to match, and you stow the clamps and you roll up the paper - roll up the - roll up your fender short-wise and put a grey tab over that and stow it in ETB you got both the clamps and the paper in ETB and then when you get out to the rover, you lay the edge of your fender over the inboard guide rail and clamp it and then you lay the other edge of the sheet over the outboard rail and clamp it, and the only thing your really have to worry about is making sure that the inboard clamp is right over the shock strut so that you don't get any interference with the LRV structure when you turn the wheel.

CHALLENGER Yeah, that's the type of thing I was going to ask about some of those subtle points. There really should

CHALLENGER be quite a ways - well I'll look at it but almost vertical over the hub right?

CAPCOM Yeah. On the inboard one. On the outboard one if you put it a little further back aft on the wheel, it allows you to - it allows you to give your paper fender a little more rigidity.

CHALLENGER And you just say lay them over the guide rails, so the clamps are also over the guide rails, they're not trying and line that - the makeshift fender in the guide rails itself, huh?

CAPCOM No, it - just clamp the thing right to the rails, just allow a little overlap and clamp that rascal right down. And I know you can tighten those clamps down so good, it'll never get loose. I know you can do it if I can do it.

CHALLENGER Okay, John, I think I know what you're talking about, and I'd sure like to give it a stab. The only hooker is I hope that tape holds the fenders together well enough.

CAPCOM Yeah they -

CHALLENGER - the pieces together well enough.

CAPCOM Roger. One of the things - when you're taping the pages together, that you want to be careful of is that you make sure and get the air bubbles out so when you get in the vacuum, it doesn't open up by itself. And maybe you can put an X across there to make sure that you - if you get any separation that's it's still held together pretty good. We think the tape will work -

CHALLENGER Okay -

CAPCOM - think the tape will work because (garble) in 13 we were using it just sort of incidentally in the thermal vacuum chamber and it worked okay there, for some reason.

CHALLENGER It would seem to stick on the surface okay if could find a dust free spot, when I put that other fender on earlier.

CAPCOM Yeah agreed.

CHALLENGER As far as how much of the new fender to overlap on the present fender, just make it about symmetrical with the other side, and probably ought to give me plenty of overlap, huh?

CAPCOM Well, are you talking about over the dovetail part of it, or are talking off the aft end of the vehicle?

CHALLENGER I'm talking about the present fender that's on there, the aft end of that fender. About how much overlap do you want with this makeshift fender? Just give me an idea. I think I could figure out when I get there, but I'd rather have your feelings before I do.

CAPCOM We think if you get it out about 4 inches past that fender -- you understand what this looks like when you get it put on the fender, if it just looks like sort of a roll and end up with a sort of a straight fender right at the back end of the Rover -- a sort of a straight -- about half a pipe straight out there. And, if you --

END OF TAPE

CAPCOM About half the pipe straight out there, and if you get it out 4 or 5 inches, why that will keep the dust from coming back over the vehicle.

CERNAN Yes, that be about where I want it, that would be about right, 4 to 5 inches. It's just sort of like a horizontal fender, like on an old automobile.

CERNAN I thought I understood what he was talking about.

CAPCOM Say again, Geno

SCHMITT Hey, John, this is Jack. Did you say pipe a minute ago? Pipe?

CAPCOM Yes, but it doesn't roll up into a circle, it's sort of a hemisphere. I mean it's half of one.

SCHMITT Oh, okay, I thought I was reading you until you said pipe, and then you lost me. Okay, I think I understand, too.

CAPCOM You know the problem I have with communication.

SCHMITT Hey, thank you, Babe, we'll give it a try. And we can get something to work.

CAPCOM Okay, and we can watch you on the tube and make recommendations - I think you've got the idea that - you know Terry Neil thought of those (garble) clamps, and that's a great idea cause you can clamp those things on that - over the dovetail, you can put a force on there, those (garble) will never get loose.

SCHMITT Yes, on those other clamps we had, I was thinking about paper clips, but never hacked it.

CAPCOM We tried that - they just don't have - they don't have the push.

CERNAN Sounds good, Babe, appreciate it.

CAPCOM Okay, we've got a detailed procedure here if you want to copy it just in case.

CERNAN Yes, stand by 1, though.

CAPCOM Okay.

CERNAN Hey after thinking and looking at the map last night, and recalling what I saw during landing and where I was planning on putting it down and everything, I still think, to the best of my knowledge, that we are about 1 to 2 o'clock, an hour increase up to about 200 meters or so west and slightly north of Poppy.

CAPCOM Okay, Okay, Geno.

CERNAN Gordie, the thing that fooled me yesterday is this depression out at 9 o'clock here, which is greatly undersized Triton, really is not Triton and I said yesterday, I didn't see how we could be that close, but we really aren't, Tritan is way out there, and I'll still hold to my 200 meters at 1 to 2 o'clock of Poppy.

CAPCOM Okay, we're thinking you might have, on the way to the geology stops, driven between a couple of the Triton craters then.

APOLLO 17 MISSION COMMENTARY 12/12/72 14:20 CST 137:27 GET 534/2

CERNAN Yeah, we may have coming back. I think I went all the way around to the east of the last one going also.

CAPCOM Okay.

CERNAN If you had asked me at 3 or 4000 feet where we were going to land, I could have told you exactly. but once you decide where it's going to be, then you decide where if and where it's going to be if you forget everything else around you.

CAPCOM Roger.

SCHMITT Besides, Gordy, when you land on a boat all you're worried about is that the boats there. You let the captain worry about where it is.

CERNAN Rog.

PAO This is Apollo Control at 137 hours 34 minutes. America with Ron Evans is behind the Moon. We'll acquire in 40 minutes on the 25th revolution.

SCHMITT Gordy, while we eating have you got a short synopsis of the news?

CAPCOM Ah, yeah. Sure do. Standby one. We'd like biomed left, please.

CERNAN I don't have any sensors on, Gordy.

CAPCOM Okay.

CERNAN You have to wait till I start putting my suit on.

CAPCOM Okay. As you might have expected front pages around the country are headlining last night's EVA with photographs taken from TV monitors showing you and Jack going about your tasks. I might add that the TV camera is really spectacular. It couldn't have been a clearer or more beautiful picture both for fidelity and color. In other news, South Vietnam's President Thieu has suggested that all prisoners of war be released before Christmas. He has also asked that all Vietnamese parties be included in peace negotiations. South Vietnam and the Viet Cong are now not directly represented in the secret talks now under way in Paris. Meanwhile Kissinger met for more than 4 hours yesterday with Hanoi Representative Le Duc To. The two negotiators are expected to meet again this afternoon. The former President, Harry Truman, is still resting quietly, although his condition remains serious according to his Doctors. American poet Mark Vandoren died at the age of 78. He was a Professor of Literature at Columbia and a winner of the 1940 Pulitzer Prize for his poetry. President Nixon announced yesterday that he wants to extend what ---

END OF TAPE

CAPCOM President Nixon announced yesterday that he wants to extend wage controls beyond the scheduled April 30, expiration date. He also plans to freeze new hiring, promotions, and pay increases for executives of the Federal Government, which doesn't effects us, I guess. The Republican National Committee has a new Chairman.

CHALLENGER How about me?

CAPCOM George Bush of Houston, who is Ambassador to the United Nations. He will continue his UN post through the present session of the General Assembly. Both National Political Parties are now headed by Texas. As you recall Robert Strauss of Dallas, became Chairman of the Democratic National Committee last Saturday. And Jack, I'm sorry to say that you've been replaced. The Nimbus 5 weather Satellite is now operating after lodge from Vandenberg early Monday Morning.

CHALLENGER Can it talk?

CAPCOM Joe, Namath, tried mightly to lead the Jets to the play-offs, but the Oakland Raiders grounded the Jets in the 4th quarter 24 to 16. I think you have all ready heard that score. Namath passed some more than 400 yards, but he was only able - New York only scored 1 touchdown. And the last item concerns the Houston weather, which is been - there has been two kinds of weather since you all left us. That's cold and light rain and cold and heavy rain. And it's still doing it. Fog and drizzly rain are here now and we're only suppose to get up to the mid 40s and probably down to 32 tonight. Over.

CHALLENGER Holy, Moly. That doesn't sound too good on the weather. I'm going to take a look, right here on the overhead window.

CHALLENGER Gordy, you're right, there's a band of clouds that comes right up the coast of Mexico. and it looks like (faded) gets up into the Texas area and Southeastern part of the United States with a - with a counter clockwise rotation which gets very bad right over the Atlantic, I believe off the Southern East Coast of the states and from about oh I guess, it may be Center Texas straight north, straight east, it looks like the whole country's cloudy.

CAPCOM Roger.

CHALLENGER Florida looks nice, West Coast of Mexico looks nice.

CAPCOM Roger.

CHALLENGER And towards(garble) the weather's great.

END OF TAPE

APOLLO 17 MISSION COMMENTARY, 12/12/72, 14:35CST, 137:42GET, 536/1

CHALLENGER Hey Houston, Challenger.

CAPCOM Go ahead.

CHALLENGER Roger, Gordy, how's the ALSEP doing and in that light I hope you people will take as close a look as you can at the signal strength and it's variation and see if you get some idea whether when I go after the flux neutron tomorrow if I ought to work on that antenna alinement again. I'm still a little bit concerned about it.

CAPCOM Okay, Jack we'll consider that although they've been getting good performance out of the central station as I understand and a couple problems with the experiments. One was the LEAM data isn't sensing up like it should. I'll have to get a further more complete story on that. And we're thinking that's mostly on ground software problem. The other one is the LSG isn't leveling up properly and we'll cover this further in the planning briefing for the EVA here but we're probably going to let you off - I mean have Geno let Jack off at the rover - I mean at the ALSEP. Let him off when you're over at the ALSEP and take another look at the leveling on the LSG. That'll be at the end of the EVA.

CHALLENGER Roger, I just may run out there and let Gene pick me up after I turn them, while he fixes the fender maybe - we'll work that out Gordy. I'm joking but maybe I could go kick the lean - that might help it.

CAPCOM Let's make sure we've got all our problems solved down here before you do that.

CHALLENGER Okay, hey Family Mountain the north evasive slope although Lohr has boulders and out crop - I mean delayed outcrop. It has boulders from local block concentrations. Looks very much like the south Massif does.

CAPCOM Roger.

CHALLENGER GARBLE I've about had it I think.

CHALLENGER GARBLE

CHALLENGER No, I've had to.

CHALLENGER Oh.

CAPCOM Go ahead.

CHALLENGER Hey Gordo, we're still eating but let me give you a few observations. That outcrop I talked about was way at the top of South Seas at the Great Slope at the very top of the Great Slope. Almost looked - it's hard to tell on an in-flight outcrop up there. It's hard to convince myself that it is. Looks like there's some very large and many, many small fragments of large - like 3 and 4 meter rock up there and a lot of smaller fragments. I see that type of thing a number of places over the South Massif, however, I do see today also they all seem to be sitting on top of the South Massif surface but I do see one other area that it looks like there is a - it is protruding from within some sort of mantle on the South Massiff So conceivably some of that could be a plate. An additional impression

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I got is - is that at least with the monocular that those fragments - those boulders, look much more angular than what we've seen here and for the most part they appear to be - if covered at all - very little by any mantle except the one I just mentioned.

CAPCOM Okay, copy that.

CHALLENGER And Gordy through the monocular the contrast of the tan gray of the south Massif - those large blocks up there look blue - very distinctly blue-gray. Not unlike Gene mentioned yesterday anorthosite. Anorthosites look in certain terrestrial environments.

CAPCOM Roger, Jack.

CHALLENGER And Gordy now that I get my - my threee dimensional eyeballs working I can look up on the scarp, out to 9 and 10 o'clock. It's practically the same color as the South Seas. It just looked to be very undulating. I see no outcrops evidence from here in the scarp. I think I can just about see where a hole in the wall is - it's so subtle that I can't really tell you much about it and the local terrain which I think is the southern rim of camelot just about blanks out where Hole in the Wall should be - just about covers it up, but what I can see in that small little saddle to our local horizon here in front of us I can see out there just about - oh, I'd say a hundred meters or so to the south of Hole in the Wall and it just looks like a Sun undulating flow. We can't really tell too much the steepness from here.

CAPCOM Okay, Geno, stand by.

CAPCOM Okay, I had something for you but we just decided to cancel. Although, when you do get out the prep & post card I have one write in for you so just holler when you want it handy.

CHALLENGER Okay.

END OF TAPE

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CHALLENGER We're wrapping up our evening drinking, here now Gordy. We'll be ready to go in a minute.

CAPCOM Okay.

PAO This is Apollo Control, at 137 hours 55 minutes. The crew of Challenger is 1 hour behind their timeline. This is a hold over from EVA 1. We will continue to run this hour behind so unless, we get further behind during the EVA preparations, we would anticipate EVA 2 to begin around 140 hours 10 minutes elapsed time, versus the 139 hours 10 minutes in the flight plan. 140:10 would be a few minutes past 5:00 PM central time. America is still out of range. We expect acquisition in 18 minutes.

CHALLENGER Gordy, Challenger. Could you ask somebody there in the FAO console to, where the hiking kit is stowed.

CAPCOM Okay. Will do.

CAPCOM Jack, take a look on the righthand side stowage compartment there, forward lower corner under the LEC Kit compartment.

CHALLENGER Gordy, you broke up with the change over or something, say again.

CAPCOM Okay, Jack. You're right I got caught right in the middle of a site handover. Look on the right hand side stowage compartment forward lower corner, under the LEC Kit compartment.

CHALLENGER Fantastic. You picked the one place I'd never look.

CHALLENGER Houston. Challenger.

CAPCOM Go ahead.

CHALLENGER One quick thought about the gravimeter, and I'm sure it's been mentioned, but all I said during the CS-squared, we asked about that bundle of wires that has contact with the Gimbal and when I deployed it that bundle was - is still in contact with the GIMBAL and every body at the CS burn said that was okay. But, you might think about it. I don't know what I could do to help if that is the problem, but that might be causing the problem here, that it wouldn't cause on Earth.

CAPCOM Okay, Jack I'll make sure the experts hear that.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/12/72 CST 15:00 GET 138:07 538/1

CHALLENGER Gordie, everything okay at home today?
CAPCOM Yes, everything is fine here.
CHALLENGER Well, thank you.
CAPCOM I'm not sure I copy your question precisely.
Haven't talked to your home today at all.
CHALLENGER Okay, don't worry about it. I just
thought you might have heard.
CHALLENGER Well, if you hear Gordie just tell them
their missed.
CAPCOM Okay, I'll sure do that.
CHALLENGER Gordie, has anybody hear from Tucson
recently?
CAPCOM Check on that, Jac, just a minute.
CHALLENGER And, Gordie, if you have any updates to
the EVA 2 checklist give me a yell.
CAPCOM Okay, the update I do have. I think the
EVA checklist changes we'll just call your real time. But, I
do have one for the prep card.
CHALLENGER Go ahead.
CAPCOM Okay, on the front side there middle
column lower half at 138:45 OBS connect half way down it
says install purge valve in PGA red to red. Mark that LMP
serial number 211 CDR 208. This is to maximize the OBS opera-
tion should you have to use it.
CHALLENGER Okay, give me the numbers again, please.
CAPCOM LMP 211, CDR 208.
CHALLENGER I take it those are serial numbers.
CAPCOM That's right, the serial numbers on the
purge valve.
CAPCOM Okay, Challenger this is Houston would
you like to have a little update on the EVA plan?
CHALLENGER Do you want me to take notes.
CAPCOM No, I don't think there are essentially
any notes required. I'll make a few real time callouts to
you, but I don't think there is anything you really have to
write down.
PAO Bob Parker is capcom now.
CHALLENGER Okay, Bob I realize that things were getting a
little hectic yesterday, but if we end up making any changes
where I don't need to get a charge in my hands that's an
awfully good thing to call because not only does it tire
your hands out holding it, but it means you don't get as
many pictures or rover samples or anything else.
CAPCOM Roger, you guys are just ahead of us today, we
were trying to get that up to you. Okay, no I don't think
there is anything here that really needs to be written down. I'll
go through with you first and we can talk about details and

CAPCOM writing in if you want to on any of them if you want to. But I don't think there is anything that really needs to be written in. The EVA is going to be essentially nominal with two minor exceptions. One is the - your allowor about five minutes extra at the LM before leaving for the rover fender fix and John will be talking to you about that in a minute. And the second big change is that we're also allowing five more minutes at the end of the EVA so that we can have extra time for dusting. And I suspect that if the rover fender fix works and we aren't getting as dirty as we did last night, then we may gain back that five minutes. Your also allowed - what we've done is taken the time here out of some of the tasks at station three and station four. And along with the fact that we think you're a little bit further east than planned and we're allowing four minutes additional gliding time. But again, that's all real time and if we're doing well on time we can reinstitute all those tasks, and get rid of the five minutes that we are allowing here, there or elsewhere. So that's just sort of keeping you thinking. There is a possibility that we'll have some additional overhead at each stop depending on what the rover battery temperatures are when you get out this morning. If the rover - if their high again then we'll have to probably park at least on some of the stops if not all with the upsun heading and dusting the battery covers and then opening them to let them cool. But, again that will depend upon what we find on the rover batteries when we get out this morning. The variations that we found on the surface of the south massif indicating a possibility of flarings. I guess you saw those mostly with the binocular. And the observation of boulder tracks and the size of the massif emphasizes the importance of sampling boulders that can be traced to sources if there is elvation on the massif. Now, I guess we should say that hopefully. Then we'll just have to see what happens when we get down to station two on that. But if we see boulders with tracks I'm sure you guys remember that they will obviously have a higher priority. Since, we didn't get to Emory and since we didn't really get to the rim of Steno itself the question of sampling - of the actual subfloor is still somewhat ambigious; although, there is a large consensus opinion that says that we sampled the subfloor we sampled at intermediate gabbro that we sampled yesterday at both the ALSEP station one. There is possible alternative conclusion which says that the subfloor has not been sampled, but that these blocks that we sampled and the surface are both parts of a later flow. And, in that line we're still looking for specific observations that will help

CAPCOM distinguish between whether or not the dark mantle is a - whether the dark mantle is a separate unit upon the intermediate gabbro that we are seeing or whether it's the - stand by. Okay, whether or not the dark mantle is an entirely separate unit from the intermediate gabbro you were sampling yesterday, or whether it just represents the top of very well churned up layer of a flow that was later than the subfloor - if you see what I'm saying there. All this says is that we're very interested, of course -

CHALLENGER Roger, Bob.

CAPCOM - all this says is that we're very much more interested in station five, as you might expect than we were before. And I guess for this reason we'll be trying to keep the timeline a little tighter than usual to guarantee that we've got some time leftover at station five. And, we're also interested in perhaps moving of station five at it's present location there in the southwest of Camelot over to the southeast or east or some location we have a feeling that it's got big boulders up on the rim. This is so we can sample, hopefully some of the white material and some of the boulders together. And get a better confirmation that the materials from deep in the subfloor unit is this intermediate gabbro as opposed to just material from the upper part of the subfloor. It's just a matter of keeping to ourselves the number of boulders we sampled yesterday are from deep in the subfloor only if the surface of the subfloor or perhaps as I said the other alternative being that the intermediate gabbro is part of the dark mantle and we're seeing a churned up regolith on top of it sort of being the gaseous upper part of the flow that has been broken down rather rapidly into the dark mantle. Okay, stand by a minute. Okay, to summarize that again reading - I guess I got ahead of myself in the little deal they wrote up. At the present time we have two working hypothesis from the dark mantle and the gabbro relationships to each other. One, the frisment of rocks that we found in the gabbro are an upper unit of the subfloor with their dark mantle cover unrelated to them in time. Key observations, that they suggest here is trigger the Camelot station five and other deep craters. Espeically, perhaps a trench and sheltered spots which are unguarded - ungardened as in plowed for an older regolith underneath the dark mantle if such a thing can be found. We don't think we found that yesterday. Or, you look at the super position relations between dark mantles and boulders. Are the mantles instances of the mantle on the boulders or inversely of small boulders on the mantle.

END OF TAPE

CAPCOM The second working hypothesis is that, the dark mantle is regolith derived from a vitreous vesicular flowtop of the crystalline rock both beneath. And, it again goes to say that perhaps that the gabbro that we sampled yesterday was indeed the (garble) flow, and what the regolith was derived from the vitreous vesicular flowtop, as it were. Again, many of the same observations are called for. In particular, they'd be interested then in looking for the coarser finds they define as from a millimeter to 20 millimeters for some sort of transitional lithologies and textures. In other words, what do the small walnut-size rocks look like, if you can and have specimens? If I can get more specific in terms of the EVA mechanics, let me say that we'll call out in realtime the deletion of the tasks at Stations 3 and 4, if they become necessary, and what we're planning on doing is deleting the trench in the base of the Scarp at Station 3 and also, deleting the radial sample on the -- on Shorty at Station 4. That's the provision that we're planning on, and depending on how the time is going, we'll call that out realtime. We also have -- experiments remain pretty much the same. We'll deploy the charges at the same locations as we're planning in the checklist at the present time. We also don't -- we're planning further ahead, we don't anticipate any significant changes in EVA-3. The charge number 5, which we're going to deploy at Emory, will not -- but didn't, will not be deployed during EVA-2, but we'll deploy it on EVA-3 out at Station 10. And, what we're going to do there, is when you take the 8-pounder and put it between the seats, we'll then have the 3-pounder left over, and we'd like to put that on one of the footpads in the Sun -- that's probably either the minus Z or minus Y footpad. And, we'll leave it there in the Sun until the start of EVA-3, in which case we'll put in the Rover underneath the LMP's seat. And, thermally that looks okay. There is a probability that we're going to play the "Return to the ALSEP Game", and we're going to do this for a couple of reasons. One, we're going to go back and look at getting some more ALSEP photos. I guess Gordy says you've got that. And, that will probably be at the end of EVA -- in fact, it will certainly be, if it happens, at the end of EVA-3 when you go back to get the neutron flux probe. I might also say with regard to EVA-3 that, obviously, we're more interested in Station 10 than we were before. Another "Return to the ALSEP" goodie that we're looking at, if we have the consumables today when you get back from finishing Station 5, is that the lunar surface gravimeter has been unable to level itself over the night, and they sent some -- oh, some thousand commands trying to get it straightened out, and they say it looks as though it's not level. And, so, we'd like Jack to go back with his practiced hand on bubble levels and recheck that at the end of -- after Station 5 today, if there's sufficient consumables. And, we've

planned for Gene to just let Jack off and let him walk back to the LM after he gets off and looks at that. And, that about -- everything we have, as I say, in summary, that the big changes are going to be extra time at the beginning, taking care of the fender extension, and the probability of extra time at the end although we'll have to see how well the fender works and how things go. The probability of extra time at the end to allow for dusting, and the time spent on those particular activities we'll probably end up taking out of the task at Station 3 and Station 4. Over. Comments?

CHALLENGER Okay, Bob. We copy all that. Obviously you're going to have to catch us in realtime on some of the details there on the charges and the task deletion. One question. Did you say we were going to delete the trench at Station 3?

CAPCOM Roger. The trench at the base of the Scarp, in other words, some of the stuff that you would be doing while Gene was taking the double core.

CHALLENGER What do you gain by that?

CAPCOM Well. No comment on that, Jack.

CHALLENGER If you haven't deleted Gene's tasks, then what am I supposed to do?

CAPCOM You're supposed to help Gene, I guess.

CHALLENGER Well, but that's not the way we worked it, Bob. Let's play that one in realtime.

CAPCOM Roger. That's why I said there's no point in marking up the checklist on that, Jack. Let me hit you with one more thing concerning the battery temps. An initial reaction down here is that the battery temps were high on deployment because of particularly unfavorable heat soaking on the way out. And, the Marshall people are hopeful that they'll be back to normal this morning. However, we're obviously anxious, as I'm sure you are to get an early reading on the battery temps. That's number 1. And number 2, just for the off chance that the meter's not working, I think we've pretty much discounted that because of the way the meter worked yesterday. But, on the off chance that the meter's not working, you might just lean over and see if the meter is reading zero before you punch in the circuit breakers, because that would give us at least a partial confirmation in that direction that there's not something wrong with the offset. If they're reading -- sitting there reading 30 to 40 degrees, then that probably says something about the offset. And, beyond that --

CHALLENGER (Garble)

CAPCOM Go ahead.

CHALLENGER I'll look at that, Bob, but the meter has indicated in terms of a temperature change. I'll look and see if there's a bias on them at all.

CAPCOM Rog. We -- we again also think that that's probably not too likely.

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CHALLENGER Bob, I think, based on what I saw yesterday, that the chances are pretty good that all the big blobs out here in the dark mantle area will be pretty much the gabbros. By the way, I looked at that with a (garble) last night, and I don't know if you got the reports, and I'm back to saying that it's probably closer to 30 -- 40 percent plagioclase. It's probably just a good gabbro, a final pyroxene gabbro, and it apparently has a fair amount of ilmenite in it. There's some bright shiny flakes within the rocks and some dark minerals in the matrix that's probably ilmenite, and one other additional possibility then is that the mantling massif here is the just dark fine glass -- darker than usual because of the iron and the titanium in the rock itself. Also, the probability I think still has to be considered that you're dealing with a true mantle that has been gardened enough that it leads us to where we're seeing it now in the first few tenths of centimeters that it is unrecognizable as a mantling unit yet. The relationship to the large boulders is, I think, one right now just ilmenite and a small amount of covering because of the local gardening process. We haven't seen any clearly mantling relationships between the dark mantle or the surface materials here and the large boulders.

CAPCOM Okay. Copy that. And, we'll be anxious to see what else you find out today, and one last word for your interest; the Marshall people have decided to allow us to go to 140 degrees on this EVA with the batteries if necessary.

CHALLENGER Okay.

CAPCOM Okay, now John would like to talk to you about the fender fix.

CHALLENGER Okay. Hold on for 30 seconds.

END OF TAPE

CERNAN Hey, while John's talking to me why don't you check my biopad out, we're going left.

CAPCOM Okay, fine we'll take a check, Geno. Let me ask you one question here on Jack's water - his PLSS water cell. We're showing about 3 pounds too much water in the LM system and we're wondering if you got the AUX tanks filled up in Jack's PLSS. Two questions. Were you sure to have the AUX valve open and did you see good clear water in the sight gage with no bubbles after the fill. Over.

CHALLENGER I guess we'd have to say yes to those questions but if you've got a question on it we can go through it again. I'd rather do that than take a chance.

CAPCOM Let me make sure we want to do that. While we're making sure I checked with both home front and Nassau Bay and Tuscon are both in good shape. Geno, Tracy upstaged you for about 30 minutes last night on local TV during her own interview there and threw everybody away from watching EVA during that time. She did very well.

CERNAN Yeah, that sort of figures. Hey Gordo why do you say Jack's PLSS - did you see the water drop in the LM when we charged mine?

CAPCOM It was the profile of the water quantity as you were filling both PLSSes and it was the fill during Jack's fill that looked suspicious like just maybe 3 pounds less than there should have been flow when you were filling Jack's.

CERNAN Yeah, you know there's - you don't - GARBLE to know whether or not you've got it filled. I sure don't want to go out there and have him just have some partial water so let's do the conservative thing.

CAPCOM Okay, I'll verify that. There was some drinking water going out at that time too which levels up the data a little bit so we're not absolutely certain on that.

CERNAN Okay, we weren't drinking water while we were filling the PLSS, however.

CERNAN Okay, you come up with what you think best on that and I'm ready to copy, John.

CAPCOM Okay, Geno, I don't think you need to copy this. Sort of just add lib it. With your four chronopaque maps, tape two maps and allow about 1 inch overlap to a 15 inch by 10-1/2 inch configuration that's estimate and then repeat with two other maps and then tape both the two maps - now four maps - tape them together, and you'll end up with a sheet that's about 15 inches by 19 inches, sheet of chronopaque. And then tape both sides of it - the overlapping edges to strengthen it and you can further strengthen it if you tape an X of tape across both sides of it and then on the roll up on the long axis and secure it with a strip of tape and put it in the ETB and on that strip of tape you secure it with be sure and leave a tab on the end of it so you can get it off with your gloves. And then remove clamps from both the utility light units and open the clamp jaws to max.

And then tighten the mounting bracket that you've got on it so it will be swinging around and stow the clamps in the ETB. You got that Gene?

CERNAN Yes sir.

CAPCOM Okay, and then now you've got everything you need and it's all put together and all ready to be fastened to the rover and then when you get the ETB in the seat you unroll the corner page sheet and you locate the front edge with the long axis fore and aft even with the axle. And you lay the edge of the sheet over the inboard guide rail and you clamp it. You lay the other edge of the sheet over the outboard guide rail and clamp it. And as I said the inboard clamp must be directly over the axel to avoid interference while steering. And tighten the clamps securely, both of them. And then while you're driving around out there by yourself, it would be good if Jack could take a look at it and see if you're getting any unusual dynamics and at station 2 you should inspect the fender for any unusual wear that might have been caused by this mass out there on the fender of those clamps bouncing up and down. One thing about it, doing it in the suit Gene, you have to push in with your leg and hold - and it's sort of a two handed job and I'm not sure in 1/6g if you could position the fender the pseudo fender on there without Jack say holding on to the long end behind the rover so that won't fall off. It works okay in 1g for 1 man but I'm not sure it's not a 2g proposition - the 2 man proposition in 1/6, over.

CERNAN Okay, we'll take a look at it, babe.

CAPCOM Okay, and you really have to bear down to get those things on the dovetail there.

CERNAN I just want to make sure of the geometry now. We want to put the - take two of those pages and put the 10 inch side together overlapping, right?

CAPCOM Yes sir.

CERNAN Then take two more and put the 10 inch side together overlapping right?

CAPCOM That's true.

CERNAN And let's take those two pieces you've got now and put them end to end so you've got a long fender.

CERNAN Sounds right to me. Sound right to you?

CAPCOM Well, you end up with 4 - you end up with all 4 pieces in a big rectangle. You see what I'm saying, you've got a 15 inch by 19 inch sheet of paper.

CERNAN Yeah, we got it John. GARBLE And if you had no overlap I guess you'd have about 16 by 20.

CAPCOM That's correct.

CERNAN But you need to overlap and taping both sides of it gives it more strength - which you need in that situation.

CAPCOM You just want to make sure it's not more than an inch or you won't have enough to cover up those dovetails.

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CERNAN Okay, Babe, we're going to work on it right now.

CAPCOM Jack, Gene, this is Gordo again. On the first charge we're recommending you hook up Jack's and according to the decal go right ahead and - stand by 1. Okay, go by the decal and do the full 5 minute fill on Jack's PLSS. It'll take that long to get the AUX tanks filled up (grble) update. And maybe that's something you can start and then work on the paper taping there.

CERNAN Okay.

END OF TAPE

SCHMITT Okay, Gordy, I started - I'm set 4 on the - set 5 on the decal.

CAPCOM Okay, Jack. John Covington advises that the site gage is not a certain indicator that your cell and so we're just going to go by time to be sure and try to disregard the site gage readings as a positive indication anyway.

SCHMITT Okay, understand that, looking back, that we went exactly by time before. We'll try it again here.

CAPCOM Okay.

SCHMITT Okay, Gordy, is that about 5 minutes?

CAPCOM Standby, see if anybody timed you here. That's affirmed. Five minutes now.

SCHMITT Okay. That's 7 is asleep.

CAPCOM Okay. We did not see any water flow to speak of. It probably was false.

SCHMITT Yeah, the condensate indications here were that it was full.

CAPCOM Okay. Better to be sure.

SCHMITT No questions.

CAPCOM Do you know - this is Houston - we want to be sure to have one look at your biomed before you get into the suit in case something is wrong with that. But you go right by the check list. We'll miss that look so when you get to a convenient point if you can go to last and let us have a look at it - we would appreciate it.

SCHMITT Gordy, apparently you - okay, standby.

CERNAN I called it out. I did give it to you, standby.

SCHMITT Okay. Now it's yours.

CAPCOM Okay.

CAPCOM Okay, that looks good, Gene. Now you can press on with the suiting up.

CERNAN Okay.

CERNAN Call me the little old fender maker.

CAPCOM Roger.

CERNAN S-band voice going to voice.

CAPCOM Roger.

CAPCOM Jack, Houston. With respect to the PLSS water cell, the last thing we heard you say was doing Step 7. We just want to verify that you did go ahead and do Step 8 which is connect the PLSS (garbled) to the PLSS OX vent for ten seconds. Over.

SCHMITT Yes, that was all done, Gordy, we just got side tracked and I didn't call you.

CAPCOM Okay. Thank you.

PAO This is Apollo Control at 138 hours 59 minutes. America is in it's 26th revolution over the

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Ocean of Storms now. All going well with Ron Evans. The lunar sounder experiment being performed and Ron taking a lot of pictures.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/12/72 15:55 CST 139:03 GET 542/1

PAO This is Apollo Control. Bob Overmeyer is the America Capcom. Stu Roosa is sitting there with him. Bob Parker will be the Challenger Capcom for the EVA. Gordon Fullerton stayed over a little from his shift. Getting ready to leave now. John Young is at the Capcom console also. Chuck Lewis is the Flight Director for America. Pete Frank the Flight Director for Challenger.

SERNAN Okay, Gordy, Jack's coming up and I'm going off the air.

SCHMITT Okay, Gordy, LMP is suited and standby - 4, 1, 2, 8, PRD is 24128. Hello, Houston. Did you copy the LMP?

CAPCOM Roger, copy. 24128.

SCHMITT How come you guys down there aren't flight directing like I am?

CERNAN And Bob, 17040 is commander.

CAPCOM Say, that again please, Geno.

CERNAN The last two didgets are 40.

CAPCOM Copy that.

SCHMITT One I got is 040.

CAPCOM Thank you.

PAO This is Apollo Control. We estimate that Challenger's crew is about 1 hour and 20 minutes behind the flight plan time line.

PAO This is Apollo Control. Brigadier General Tom Stafford and Colonel Charlie Duke have joined a half dozen or so other astronauts at the Capcom console.

PAO This is Apollo Control at 139 hours 29 minutes. We've had loss of signal on America. The spacecraft has gone behind the Moon on it's 26th revolution.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/12/72 16:24 CST 139:30 GET 543/1

PAO This is Apollo Control at 139 hours
30 minutes. America's orbit now 69.8 by 53.4 nautical miles.
We'll reacquire America in 42 minutes.

SCHMITT Bob, how do you read the biomed on the
LMP?

CAPCOM Rog. Standby, Jack. It looks beautiful
Jack. I think that means loud and clear.

CAPCOM And Challenger, if you changed your
ECF mile can?

SCHMITT Bob, we did not. I guess we should admit
that in the checklist.

CAPCOM Okay, that's sort of towards the end of
3-9.

CERNAN Bob, I guess we're not quite there yet.

CAPCOM Okay, copy that.

CERNAN Okay, Bob, the cannister's changed.

CAPCOM Roger, we saw that. Thank you.

CERNAN Okay, biomed left.

CAPCOM Okay, copy that.

SCHMITT Bob, how do you read me?

CAPCOM Loud and clear, Jim.

CERNAN Battery management going.

CAPCOM Roger.

SCHMITT 37.2 both batteries.

CAPCOM Okay, Jack. Just like always.

SCHMITT PCM is high.

CERNAN Are you ready for the battery?

CAPCOM Standby, we're still picking up turn out
water, and high bit rate.

CAPCOM Okay, and Geno we have good data from
you on the surging. And we have high bit rate.

CERNAN That's good to hear. I got good data
up here.

CAPCOM Yeah, we're going to do the battery
management now, huh, Jack. I got the high bit rate.

SCHMITT Roger.

CAPCOM And a thought for the day. We're not
sure if there is going to be any need for the scissors outside
today. If you guys wanted to keep from picking them up off
the ground and worrying about them, you might just leave them
inside if you haven't packed them already.

SCHMITT Bob, you never know. We're going to take
them out with us. So just make a note that we bring them
back in. Would you?

CAPCOM Okay. I'll make a little note again.

CERNAN Okay. Battery's complete and your cue
on the low bit rate.

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CAPCOM Okay, you can go low bit rate again.
We've looked at the dot two.
SCHMITT LMP is 6100 on the OPS.
CAPCOM Copy that Jack.
CERNAN And about 5850 on CDR.
CAPCOM Okay, copy that Gene.
CAPCOM And you guys got the word about which
purge valves to use.
SCHMITT That's affirmed.
SCHMITT PDR and OPS is GO.
CERNAN LMP's GO.
CAPCOM Okay, copy that. Good.
SCHMITT Okay, Bob, the fore hedge is unlocked.
CAPCOM Okay, copy that.
SCHMITT Bob, the LMP has his OPS on. Yeah, would
you believe the PLSS?
CAPCOM Say again, Jack.
SCHMITT The LMP PLSS is on.
CAPCOM Okay, good enough. I bet the CDR's doing
his now.
CERNAN You're right.

END OF TAPE

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PAO This is Apollo Control at 140 hours 4 minutes.

CHALLENGER Turn the top of the right hand column.
CAPCOM Okay, copy that.

PAO We're now estimating EVA start at 140 hours 40 minutes. 140 hours, 40 minutes. About 5:33 p.m. central.

CHALLENGER AGS up to mid VOX. A going to TR, B is RECEIVE, A TR, B receive. Bob, How do you read commander on VOX?
CAPCOM Loud and clear, Geno.
CAPCOM Okay, Jack, I'll be able to hear you.
CHALLENGER And 16 SC audio open. They connect to your PLSS COMM.
CAPCOM And when you get done with that we'll go right in to the copy.
CHALLENGER Yeah, definitely.
CAPCOM Okay, your audio closed. Okay, your PLSS PTT to main, right? Verify? PLSS mode A.
CHALLENGER Okay.
CAPCOM Okay you'll get a tone at midflag - press flag and an O2 flag.
CHALLENGER Press flag, midflag.
CAPCOM Okay, give Houston a call and give your - your oxygen readings.
CHALLENGER Okay, Houston, this is the LMP with 93 percent, 93 percent.
CAPCOM Okay, Jack we read you loud and garbled just like last night when the antenna was stowed.
CHALLENGER Okay and 93 percent.
CAPCOM Copy the 93 percent.
CHALLENGER Okay, Houston you got 93. Okay, he got that Jack. Okay, we'll leave the antenna in - okay on mine I'm going to open my audio and connect to the COMM, Jack.
CHALLENGER Okay.
CHALLENGER Okay, Houston, GARBLE cabin pressure may be high. I picked out a little buffing in the ECS system.
CAPCOM Rog, stand by on that.
CHALLENGER GARBLE.
CAPCOM Okay, Challenger we're seeing it as the water separator.
CHALLENGER Jack, we can see that. You can pull the water separator circuit breaker.
CHALLENGER Hit your disconnect. Okay, that's better.
CHALLENGER That should do it - I think we've fixed it. I had the hoses is in my storage box.
CAPCOM Okay. Copy that.
CHALLENGER GARBLE
CHALLENGER Let me give them. Houston CDR is reading 91 percent.
CAPCOM Okay, copy 91.
CHALLENGER Did you get that Jack?
CHALLENGER Yeah, I got it.

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CAPCOM Okay, LMP COMM check okay. You did them.
Okay, you go B and I'll go A.
CHALLENGER Okay, going B, Houston. LMP on B.
CHALLENGER Okay, and CDR's B, I'm reading a loud and
clear, Houston how do you read CDR?
CAPCOM I read you loud and clear.
CHALLENGER Okay, let's go to AR Jack you'll get a tone.
Okay, you're loud and clear. AR.
CHALLENGER Okay, AR, how you read? You're loud and
clear, how me.
CHALLENGER Yeah, so are you.
CHALLENGER Got my tone.
CHALLENGER Yeah, and I got mine too.
CHALLENGER B got a no flag and a vent flag - push flag
and a -
CHALLENGER That's affirm.
CHALLENGER Okay, Houston how do you read CDR?
CAPCOM Loud and clear, CDR.
CHALLENGER And how do you read the LMP?
CAPCOM Loud and clear.
CAPCOM Okay and we have good PLSS data for both of
you.
CHALLENGER Squelch?
CHALLENGER Full decrease.
CHALLENGER Yeah, that's squelch. VFO to squelch.
CAPCOM Okay.
CHALLENGER On 16 ECS to LCG pump closed - why don't
you close it again.
CHALLENGER Okay. Closed.
CHALLENGER Okay on 16 cabin repress closed. It's closed.
CHALLENGER Let's get this too, huh?
CHALLENGER Okay.
CHALLENGER Okay, cabin repress closed, suit pan Delta P
open.
CHALLENGER Delta P is open, suit pan 2 open.
CHALLENGER Suit pan 2 open.
CHALLENGER Verify ECS caution and O2 and water sep light
come on in about a minute.
CHALLENGER Okay we'll watch for it.
CHALLENGER Suit gas to full egress.
CAPCOM Need to verify.
CHALLENGER Okay, that's egress.
CAPCOM Cabin has returned to egress?
CHALLENGER Okay, egress, suit circuit release, AUTO.
CHALLENGER AUTO.
CHALLENGER Okay your OPS connect. Suit iso activate
override suit disconnect - disconnect your hoses GARBLE PGA
they're stowed. Done. Connect GOPSO's to PGA Blue Blue. OBS
going to PGA and I'll turn around and let you.
CHALLENGER Okay.

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CHALLENGER Make sure I get that.
CHALLENGER Okay. Come to the GARBLE connector. Okay,
you ought to get - let's see where are we -
CHALLENGER Right here.
CHALLENGER Oh, here it is now. MASTER ALARM in ECS light.
Water SEP light.

END OF TAPE

CHALLENGER Okay, it is lock motors on.
CHALLENGER Okay.
CHALLENGER Now, you want 211 right.
CHALLENGER Roger, 211.
CHALLENGER Okay, Bob, LMP is getting purge 211.
And out to the side - there you go.
CAPCOM Okay, we copy that thank you.
CHALLENGER There. Locked it. Okay, and you are low
and you are in and you are locked.
CHALLENGER Okay, purge valve is in.
CHALLENGER Man you're vertical.
CHALLENGER Okay, you got to do the same.
CHALLENGER Okay, get my hose - water hose. Come
around behind my shoulder. It won't fit in there. Okay,
it's in there and it's locked, vented and the dust cover
is on.
CHALLENGER Okay.
CHALLENGER And now we get to put your purge in 208.
CHALLENGER Make sure it's in low.
CHALLENGER It is and low and the pin is in. Okay.
And you like it where? Down a little bit?
CHALLENGER No, same place just - no let me show you.
CHALLENGER Right there?
CHALLENGER Yes.
CHALLENGER Okay, there and verify still in low and
locked.
CHALLENGER Okay.
CHALLENGER Okay, that's good.
CHALLENGER Let's get another zap of water here.
CHALLENGER If I have any more water I'll float out
there.
CHALLENGER (Laughter).
CHALLENGER Good Navy man.
CHALLENGER Be a good place to fill with water and
make a nice rec site out of this valley. Could you put some
cabins up on the side of the massif. Nice flat bottom no
trees. Both mags up - the fishing ought to be pretty good
if you stocked it.
CHALLENGER Have a bear island and a family island.
CHALLENGER We're going to fill up the other end so
it doesn't drain out.
CHALLENGER Looks funny like that.
CHALLENGER Snaps, snaps, snaps, the whole world is held
together with snaps.
CHALLENGER Okay, I've got my hand lube. You can
position your mikes.

CHALLENGER Water is going off.
CHALLENGER Okay.
CHALLENGER Fasten your mikes now before we turn the fans on you'd better -
CHALLENGER Well let's just look ahead we've got helmets ready to go - big bag position you happy with.
CHALLENGER Yes, more or less a little far out, but I think -
CHALLENGER Make sure you've got the plug out.
CHALLENGER Okay, plug is out. My end's red now but you can get it out.
CHALLENGER Feel a little pressure in there.
CHALLENGER You might let out.
CHALLENGER Okay, and then we'll lower our protective visor and secure tool harness and self belt straps.
CHALLENGER Okay, and that's loosened.
CHALLENGER That's already stowed. Okay, let's start with you first. You can turn your - let me get your (garble) then you can get it over your head and turn your 02 - your fan on rather.
CHALLENGER Okay.
CHALLENGER Okay, you ready? Okay, check all that - wait what is this right here. Okay, and let me make sure it's in front of everything.
CHALLENGER Okay.
CHALLENGER Alinement is way over here.
CHALLENGER Let me -
CHALLENGER That's good. Okay, that's alined right there.
CHALLENGER Oh, boy.
CHALLENGER That will never do.
CHALLENGER Put that down in there. Okay you're still clear.
CHALLENGER And I shove it.
CHALLENGER I think it's caught on the food stick I think can open it up.
CHALLENGER I think you're right.
CHALLENGER Okay. Get it all the way off.
CHALLENGER Okay, now let's try it. Looks like it's going to be much better getting back.
CHALLENGER Want to make sure that thing is on.
CHALLENGER No, not happy yet. Not happy yet.
CHALLENGER Guess what now. I tell you I got my fingers on it all the way around.
CHALLENGER Okay. It's locked the line better put your fan on here pretty quick.
CHALLENGER Okay, fans on.

CHALLENGER Okay, let me get you dressed up back here. If that center doesn't work your going to keep this thing -

CHALLENGER And I'm vertical.

CHALLENGER You are vertical alright. Okay, your covered down there. You are locked. Okay - whoo okay.

CHALLENGER This is my turn.

CHALLENGER Let's verify all these things.

CHALLENGER Okay, go ahead.

CHALLENGER Okay, got your comm, that's your OPF, that's your inlet, that's your oxygen or exhaust and purge valve.

CHALLENGER Okay.

CHALLENGER And your water.

CHALLENGER Okay, let me take a look at all yours. Okay, that's locked - locked, that's locked your vertical, that's locked, that's locked, that's locked. Okay, get my helmet on. The main thing is to get this stuff back over here.

CHALLENGER Yes.

CHALLENGER Way out.

CHALLENGER Okay, can you grab your food stick because that hung up on mine.

CHALLENGER Okay.

CHALLENGER Got it, you're locked. Feels good in the back?

CHALLENGER Yes. And it's locked.

CHALLENGER It's hard to see with that visor on there.

CHALLENGER Okay, that's the latch down, you're locked again.

CHALLENGER And, she's in the engaged position here, huh?

CHALLENGER That's affirm. I'm engaged

CHALLENGER Okay, verify, verify, verify. Circuit breaker wiped out plus EVA decals.

CHALLENGER Can you give me a little room to turn?

CHALLENGER Yes, go ahead.

CHALLENGER Okay, white, white leave the pump on for minute. You want.

CHALLENGER Yes.

CHALLENGER Okay, and EVA decals alright.

CHALLENGER Okay.

CHALLENGER You want me over here?

CHALLENGER Let me turn the page. Don our EV gloves.

CHALLENGER Okay in work.

CAPCOM And Geno, we don't have your fan on if you've got your helmet on you ought to have your fan on.

END OF TAPE

CAPCOM Geneo, we don't see your fan on if you've got your helmet on you ought to have your fan on.

CHALLENGER Thank you, Bob good call. The royal MOCR Whee. Boy, grease and lunar dust really make a nice Mobile graphite material.

CHALLENGER Okay, I'm locked on the right verified. The old gauntlet works coming on. Okay, and I've got my cover on over here. Get yours?

CHALLENGER Yes, I'm getting one of them anyway.

CHALLENGER I can get the other one for you.

CHALLENGER Okay, number two. Okay, (Garble) many. Vents on and locked and locked verified.

CHALLENGER I may be learning how on these finally. Okay, mine's on and locked. If I can get my black band on here. I think I'm learning how Geneo. Crazy. Like a trained band putter oner. Okay, I feel pretty good. Need some help?

CHALLENGER No, mine's all on. I can't figure that out. Must be easier in 1/6th g.

CHALLENGER (Laughter).

CHALLENGER Get my gauntlet down. And that's dirt protecting dirt.

CHALLENGER Don't throw down a gauntlet, Gene.

CHALLENGER That's dirt protecting dirt. Okay, it's all on Jack. Okay, where did we leave off?

CHALLENGER Right up here.

CHALLENGER Okay, EK is not biting, LGC cold, let's leave it cold.

CHALLENGER Well, I guess you've got to open it now, we've got to disconnect the water.

CHALLENGER You ready?

CHALLENGER (Garble). Okay, it's disconnected.

CHALLENGER Okay, and did you disconnect your -

CHALLENGER Let me come around - okay, let's turn around and let's help each other. Let's get the -

CHALLENGER It's still 3 degrees. Pitch up 5 degrees.

CHALLENGER Pitch up yours - It's an awful nuisance, Cernan. Hold that for a minute.

CHALLENGER I don't know why you don't learn to land one of these things.

CHALLENGER Hold that for a minute - it was a pitching deck. Okay, that is in, boy, it's in. Locked - took a lot of --in it now.

CHALLENGER Okay, dust cover is covering it.

CHALLENGER Okay. You know this chamber runs we had were probably some of the best training we did. I hate to say that. But it was some work. Push that thing on. There

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CHALLENGER you go. Good. Keep trying. It was just a
little sluggish. Let me verify it - lock. It won't turn.
CHALLENGER Everytime you do that my stomach gurgles.
CHALLENGER (Laughter). Okay, let me turn around
to stow.
CHALLENGER You can stow that and mines over here.
CHALLENGER Okay, Attach to our PLSS water hoses.
PLSS diverter valve min, want to verify that -
PAO We estimate the crew may be ready for
depressurization in approximately 5 minutes.
CHALLENGER And, the connected PLSS water hoses verify
lock PLSS diverter valve min and PLSS pump okay.
CHALLENGER Wait a minute. I want to make sure this
is out of the way when I come in.
CHALLENGER Okay, watch my diverter min.
CHALLENGER Watch your diverter -
CHALLENGER It's min.
CHALLENGER It's min - your pumps on and pressurize A and
B egress.
CHALLENGER Okay, pumps on.
CHALLENGER Man I am getting a little bite in my -
CHALLENGER Okay, the next thing is to turn your
PLSS 02 on anyway.
CHALLENGER Oh okay.
CHALLENGER Then we go to egress.
CHALLENGER Egress.
CHALLENGER Egress on the rig.
CHALLENGER The rigs egress.
CHALLENGER Okay, you ready on my mark.
CHALLENGER Wait a minute.
CHALLENGER Tell me when your ready.
CHALLENGER Find it.
CHALLENGER Say when.
CHALLENGER Well, where is it. Okay, let's go at it.
CHALLENGER Okay mark it. Get it?
CHALLENGER If not I'll get it for you.
CHALLENGER No.
CHALLENGER Here let me get it for you.
CHALLENGER Wait a minute. I didn't get it. No,
there it is. Okay, I've got it. Okay, we going sat the same
time I've got it marked.
CHALLENGER Okay, PLSS 02 2902 flag. PLSS flag
clear 31 to 41 at 34. Up guage 37 to 40.
CHALLENGER Do you need me to watch the panel or
you got it.
CHALLENGER No, no sweat I've got that. We'll have
to get the PLSS 02 off. I'll get mine I can reach yours
real easy. I can get it in a minute. As soon as we get up

CHALLENGER I'll get it. I can reach it, I think, now. And we're going up to high pressure here when we start dumping the cabin.

PAO The EVA clock will start when the cabin pressure reaches three and a half pounds.

CHALLENGER Hand clock through 35 now - 34 really.

CHALLENGER Just off the peg here. My press flag didn't clear.

CHALLENGER There's mine.

PAO Crew is checking suit pressurization. They have not yet started depressuring the cabin.

CHALLENGER Turn mine off. Okay, mark it, it's off.

CHALLENGER Where are you. At 385. Okay when you get up you can turn yours off give me a hand and I'll check the time.

CHALLENGER Okay, mines off.

CHALLENGER Okay check your pressure.

CHALLENGER 38. I went at 20 you went at 30.

CHALLENGER It looks like it's a little tighter.

CHALLENGER That was the suit we were checking yesterday up in orbit, though.

CHALLENGER Yes, but we were up two tenths.

CHALLENGER Yesterday too.

CHALLENGER I did.

CHALLENGER I'm coming down 20 more seconds you got 30 more seconds.

CHALLENGER I'm over about a tenth I guess.

END OF TAPE

SCHMITT Okay, one minute for me Houston.
CAPCOM 85 to 72.
CAPCOM Copy that Geno.
SCHMITT Okay, that it?
CERNAN Okay, mark yours.
SCHMITT Okay, and the LMP was 8 - .8 to .7.
CAPCOM Okay, copy that.
CERNAN And I'm back on.
CERNAN Okay, and we'd like your GO, Robert.
SCHMITT You're, you're repress.
CERNAN Okay, Jack, 16 cabin repress OPEN and
cabin repress valve CLOSED.
SCHMITT Okay, cabin repress. Circuit breaker
first. Circuit breaker first. Cabin repress OPEN.
CERNAN Okay, might turn around here. Okay, it's
open.
SCHMITT And repress valve closed.
CERNAN Okay. It's going closed. And stay over
there as far as you can cause I got to get the overhead dump
bell.
SCHMITT Okay, I'm over as far as - I can turn
around and give you more room.
CERNAN Yeah, turn around and you'll have to look
at the cabin.
SCHMITT Watch yourself there. You went awfull
weak there all of a sudden. Are you - hello, how do you read?
CERNAN Very weak. You better call again.
SCHMITT Very weak.
CERNAN Okay, my volume got tang -
SCHMITT You got to hit your volume.
CERNAN Okay, now.
SCHMITT Let me get over here -
CERNAN Wait a minute.
CERNAN Is that enough.
SCHMITT Yeah, you've garbs in the way.
SCHMITT Okay. I can get at it now.
CERNAN You want to go to - you want to get that.
SCHMITT Open and AUTO at 3.5. Okay go ahead.
CERNAN Okay, coming down. I can see it open.
There it is. That's 5, 4 and one-half, 4, standby. Mark it.
It's OFF, stay at about 3.4. And I go.
SCHMITT Look at our watch. Okay?
CERNAN And my cuff gage went up to 5. 5.0. Good.
circ circuit at 4.6. That's okay. And I'm decaying.
CERNAN Are you decaying?
SCHMITT Okay, we can start our watch.

CERNAN Our watch is started. At 5:30. More or less.
SCHMITT My watch?
CERNAN At 5:30.
SCHMITT Yes sir. Okay. Good bye.
CERNAN Okay, overhead forward dump valve OPEN.
Okay, baby.
SCHMITT It's open all the way.
CERNAN Okay, and pressure's coming down.
SCHMITT Okay. I believe it. I get a tone and
HO flag.
CERNAN You popped your relief I think.
CAPCOM Clock started at 140:34:49.
CERNAN Put cabin up.
SCHMITT Cabin is 1.2. One.
CERNAN See if I can partially get the hatch open.
SCHMITT That's .7 Bill.
CERNAN Okay.
SCHMITT .5, .3. You got it at what .2 yesterday.
CERNAN Why don't you move over as far to the
right as you can so I can bend down.
SCHMITT Well, that's as good as I - can reach it.
CERNAN Nope, too much pressure on it yet.
SCHMITT Okay. About .3.
CERNAN Okay, there's my big (garbled)
SCHMITT Alright.
CERNAN In that case let me see if I can - Oh,
man.
SCHMITT There you go.
CERNAN Nope.
SCHMITT It's unlocked, huh?
CERNAN Yeah, I unlocked it earlier.
SCHMITT 0.2 Yeah, it's unlocked.
PAO America is over the landing site now.
CERNAN Here it comes.
SCHMITT There goes all the junk out there again.
SCHMITT Get that ice.
CERNAN Yeah.
SCHMITT Okay.
CERNAN Cleaned some of the dust out I hope.
SCHMITT Yeah, there goes a lot of junk.
CERNAN Sure wish it would clean the dust out.
But it isn't. It cleaned everything else out.
SCHMITT Okay, Geno, we turn our PLSS water ON.
CERNAN Okay.
SCHMITT If we can get to it.
CERNAN Okay, like a water valve.
SCHMITT Okay, mines ON.

SCHMITT LMP's water's ON.
CERNAN Okay.
SCHMITT Okay. Open.
CERNAN Alright, there.
CERNAN My water flag is clear.
SCHMITT That must means you've got feed water pressure.
CERNAN Okay. Open hatch. Up into cooling position. Rear by PG 3746. Mines coming to 4A, staying there a second. CB status pre amps and ECS
SCHMITT Rog.
CERNAN Water circ light on.
SCHMITT Rog.
CERNAN Okay.
SCHMITT I mean affirm. Get my terminology straight here.
CERNAN Okay, Jack, I'm gonna - we're doing about a 90 here.
SCHMITT Okay, let me - I need to turn around as soon as you do.
CERNAN So I can help you.
SCHMITT And get under that ---
CERNAN That's better.
SCHMITT Okay, knocked it off.
CERNAN Okay, I'm out of the way now if you can move your left leg.
SCHMITT Okay. I got an O2 flag. And it's clear.
SCHMITT The pressure is 46.
CERNAN Okay, Houston, is your happy - CDR is going to get out.
CAPCOM Roger, we're happy Geno.
CERNAN Okay.
SCHMITT Okay, hatch is full open.
CERNAN Okay.
SCHMITT And your scraping your - just a little bit. Just get your buttons down there. That's good. Okay. Oh, hey, remind me to fix your foot straps - your donning straps.
CERNAN Okay. That is ice by the way, Jack.
CERNAN Oh, me, I tell you, with a stiff suit - still at 45. But I am out here on the porch.
SCHMITT Okay.
CERNAN Oh, man, okay, I'm out here.
SCHMITT I assisted you.
SCHMITT Okay, here comes the jett bag whenever you're ready.
CERNAN Well, okay, I'm off that. Man I wish this suit would come down to 3.8. Here it comes. Okay, any time.

END OF TAPE

SCHMITT Give it a wat, there you go.
CERNAN Oh, the beauty of - -
SCHMITT Get back.
SCHMITT Okay, let me look at something here.
SCHMITT (Laughter)
CERNAN What's that.
SCHMITT I just turning my checklist pages.
CERNAN Oh, here you go.
SCHMITT Okay, (garble) bag, I need - What you got next
ETB?
CERNAN ETB
CERNAN Okay. Can you reach it?
SCHMITT Yes, (garble) get it hooked up here. Okay,
turn the tape recorder off.
CERNAN Tape recorder's off. (garble) that's a legacy of
Gemini 9. (garble)
SCHMITT EVA decals. ETB is hanging.
CERNAN That all I need?
CERNAN I think so.
SCHMITT You hit your comm again.
CERNAN No, I didn't I'm okay.
SCHMITT What happened to the static, did we loose
Houston?
CAPCOM No. We read you loud and clear.
SCHMITT Hello, Houston. Oh, you must have
switched to - Oh, I don't know.
CERNAN Okay, I'm going down the ladder.
All of a sudden all the noise is gone, that's
very good.
God speed the crew of Apollo 17, I think I'll read that every time
I come down the ladder.
SCHMITT Okay, all the circuit breakers are
verified. Noise is back. Okay, my visor's coming down. Utility
lights are off.
CERNAN We're not going to use the camera?
SCHMITT Okay, I get to get out.
CERNAN Okay, Houston. On this fine Tuesday
Evening, as I step out on the Plains of Taurus-Littrow,
Apollo 17 is ready to go to work.
CAPCOM Roger, Geno, Good deal.
CERNAN And the first thing I'll do is give you
TGE, let me turn it on. And you want a reading. Okay, it's on.
Bob, and the reading is, 222, 262207, that's 222, 262207.
CAPCOM Roger, we copy that, Gene.
CERNAN Looks good from here Jack, keep coming.
SCHMITT Come on hatch. Oh, what a nice day. Ah,
Funny, there's not a cloud in the sky. Except in the Earth.
Take it nice and easy today and get accustomed. Whoohy. Okay.

CERNAN Be right there Jack to get the antenna
as soon as I turn the LCRU on.
SCHMITT Okay, I'm on the ladder. Door is closed.
CERNAN Okay, Apollo switch is internal. I'm in
mode 3. LCRU blankets are open 100 percent. AGC is 40 plus
and power is about 18. Sensors are about 16 or 14.
CAPCOM Okay. And we have a good picture there,
Geno. Thank you.
CERNAN All ready, huh.
CAPCOM All ready.
CERNAN Well, let me just tweak you up a little bit.
Okay, I've got you tweaked, right in the middle.
CAPCOM Thank you. And, Gene after you - -
CERNAN Okay.
CAPCOM - - battery covers up front there, why
don't you go back and give us that temperature reading and
then put the breakers in and then give us another temperature
reading on the batteries.
CERNAN Yes sir, I'll do that. Jack, here,
let's get the antennas.
SCHMITT You want to get - you want to hang on
to Rover?
CERNAN I guess - well, okay.
SCHMITT I think it's easier.
CERNAN Now, I'm low, so get mine, I'm in a
hole.
SCHMITT Okay, you're up.
CERNAN Okay.
CERNAN (garble) down there yet.
SCHMITT Gotta secure the flaps.
CERNAN Okay, you're all right. Okay, you're
up
SCHMITT Okay.
CERNAN Okay, power switch is going to stand by. And
the temperature is 80. And I'll close the blankets.
CAPCOM Copy 80 on the SEP.
CERNAN That's affirm.
CERNAN You know what happened, the VELCO came
unbonded. That's why those don't hold down.
SCHMITT We probably ought to get a piece of
tape on those. Because they've got a set and it's going
to get dusty.
SCHMITT The blankets there's no VELCO left to hold
the sep blankets down, Bob.
CAPCOM Okay, I copy that Jack.
SCHMITT Do you have a reading on the gravimeter?
CERNAN Yes, I took a reading, Jack.
CAPCOM It's measuring right now Jack, we'll
get it later.

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SCHMITT All right.
CERNAN Okay, I hope I didn't hit it with some
dust.
SCHMITT Hey, it is not measuring, Bob.
CAPCOM That's right, sorry about that.
SCHMITT All I did was take a reading. I turned
it on and took a reading
CAPCOM Yeah, you're right, you're right, I'm
wrong.
SCHMITT Okay - -

END OF TAPE

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CERNAN Okay, Bob.
SCHMITT Hey, Bob.
CERNAN The battery temperatures are zero and zero.
CAPCOM Copy that. Okay.
CERNAN Bob there's your pendulum.
CAPCOM Okay.
CERNAN It's not a very good one. I'll work on that.
PAO That's Jack Schmitt with the equipment transfer bag.
SCHMITT Are you going to be there for a minute, Gene?
CERNAN Just putting these GARBLE in GARBLE.
SCHMITT All right you'll be glad to hear this. We've
got 70 on battery 1 and about 92 on battery 2.
CAPCOM Beautiful. Beautiful. 70 and 92, I copy.
SCHMITT Yes sir.
CERNAN Let me just verify this GARBLE, Jack and I'll
be all done.
SCHMITT Okay, you've got it. I'm all done.
CERNAN Okay. Okay, here's your old fender.
SCHMITT That work on that?
CERNAN Surely.
SCHMITT Now I think I'll go to intermediate cooling
to start with here.
CERNAN Okay, I think I will too GARBLE.
SCHMITT One zap of cold, to see if it's working. It's
working, and back to intermediate.
CERNAN Okay, go out to MAGS.
SCHMITT Okay, MAG.
SCHMITT I'll have the same problem with this SRC I bet.
CERNAN Bag Romeo is going to go on the old 500 in
a minute.
SCHMITT Bag India, is in there. Bag Kilo, Bag Juliet
Bag Bravo, Bag Delta.
CERNAN Okay, Bob, the SRC organic sample has been
sealed. And the SRC lid is staying almost closed about 2 or 3
inches open, if that's fine I'd like to leave that.
CAPCOM Okay, go ahead and leave it Gene if it's
not we'll get back with you on it.
CERNAN Okay, I'm going to hit your gravimeter here,
polarizing filter, GARBLE light clamps.
SCHMITT And the light is flashing.
CAPCOM Copy that.
CERNAN Traverse.
CAPCOM Okay, and Jack you can - ready to take care of
it - Sarge, remember EP4 goes within the rover seat and EP5 we're
going to put on one of the footpads in the sun probably wither the
minus Z or the minus Y footpad, whichever is more convenient probably
the minus Z is. Just as long as it is sitting in the sun that's
the important thing on a footpad.

SCHMITT Okay.
CERNAN Boy, oh boy. Going to be a - Why won't that
come out?
CERNAN Bob, I'm having a little trouble getting the
LCRU battery out. I'll have to - I'll have to go back and use
two hands.
CAPCOM Okay, that sounds like a familiar problem.
CERNAN Well, you got any familiar answers?
CAPCOM Someone who's been there before says you
just got to work it back and forth before it comes loose.
CERNAN Okay. I can get that Jack. I've got to -
SCHMITT Want to hang that up?
CERNAN Yeah, I've got to work here anyway.
PAO The explosive in those charges is hexonitro-
stilbein or HNS. It's a pliable, semi-solid.
CERNAN Okay, Bob, it's on the minus Z and the - one
corner is facing directly into the Sun.
CAPCOM Okay, copy that.
CERNAN That's EP5.
CAPCOM Roger that and I copy number 4 was put between
the seat.
CERNAN Yeah, it's - a - yeah, it's between the seat,
or will be very soon. Boy this is ridiculous. Ridiculous. Whoops
I need that other turn. Well, They weren't getting upset about it
but it sure makes you start up.
SCHMITT But you shouldn't have to this way. Come
on just don't wear your hands out now.
CAPCOM Hey, Geno.
CERNAN Need a little help.
CAPCOM Geno, wiggle it gently.
CERNAN Just got to wiggle.
CAPCOM Giggle it gently and sort of let it come free
there. It's a matter of it wedging itself in, of course on the
parallel rail.
CERNAN Yeah, I see what's happening, Bob. Still
ridiculous.
CAPCOM GARBLE.
CERNAN Did you get my comment about the - about the
SEP receiver?
CAPCOM Roger, that the blanket won't stay closed.
We're talking about that down here.
SCHMITT Boy, a bag of peanuts. Whew. Man in space.
Without them we'd be lost.
CERNAN Without them we wouldn't have the LCRU in
the MESA probably. (Laughter).
SCHMITT I ought to shove it.
CERNAN Okay, let me see what I can do for you while
I'm here. Okay.

END OF TAPE

CERNAN Okay. LCRU battery (garble) dust brush to
LCRU. Okay, I'll go get that, then I'll get to work.
SCHMITT Hey, Bob, what's my shadow length right now?
CAPCOM Stand by, I'll ask. We'll get it for you
momentarily.
CAPCOM Okay, Jack, we've got 4.5 meters or 15 feet.
SCHMITT 4.5 meters, huh? Fifteen feet. Is
that how long I am on the ground? No wonder I've misjudged
distance. Zap.
SCHMITT Hello there, Houston.
CAPCOM Hello there. Okay, Jack, and do we have the
new charge transporter on the pallet?
SCHMITT I'll say yes, but you could have looked for
yourself.
CAPCOM No, we just looked away.
CERNAN Yeah, it's here. It's here, Bob.
CAPCOM Copy that. I won't ask if we got the LCRU
battery. That one, I did see.
CERNAN Yeah, we got it. You don't think I'd leave
it here? Okay, seven. Boy, this gauge's working like a charm.
Okay. Transfer from 5 to 7. Okay?
CAPCOM Okay and --
SCHMITT Okay, the pan's complete.
CAPCOM Okay, Jack. Copy that.
SCHMITT And, Bob, those bands pans around here have more
pictures because I'm having to be sure I get the Massifs -- I'm
having to take extra pictures.
CAPCOM Okay. Copy that. And I guess we'd suggest
that, if you haven't talked about it already, that you work on
the fender before you do the geo prep. You don't have your cam-
eras and bags to worry about at that point.
CERNAN Okay. Would that be a good time for Jack to
go to the ALSEP, do you think? Or do you think we both have to do this
fender?
CAPCOM No, the ALSEP work we're not going to do
until the end of the EVA.
CERNAN I heard John's words. Okay.
CAPCOM And, Jack, if Gene's working there on
unstowing SCB whatever it is, 5, yeah, 5 -- maybe when you put the
camera down, you might want to shoot off a few 500-millimeter
frames of the North and South Massifs, if they look interesting.
I can't tell from the TV. That might be an opportune time to
grab a couple.
SCHMITT If they look interesting. If they look
interesting! Now what kind of thing is that to say?
CAPCOM Then, when Gene gets done configuring that
SCB-5, we'd like to get on with the fender fix. Then, we'll do
the geoprep after that.

SCHMITT We'll get on with it, Bob.
PAO SCB is sample collection bag.
CERNAN My God, we got a lot of lose stuff in SCB-7.
CERNAN Okay, Bob, I got three core tubes -- wait a
minute -- only got one core cap dispenser. Let me get the
other ones. Okay. (garble) Okay, three core tubes,
two 20-bag dispensers, 1 core cap dispenser, and a short can.
CAPCOM Okay. Copy that, Geno.
CERNAN Jack, are you ready to work?
SCHMITT Yeah.
CERNAN See this right here?
SCHMITT Yeah.
CERNAN I'm going to put that right there.
SCHMITT Okay.
SCHMITT Are you ready to work?
CERNAN Just let me turn my page here.
SCHMITT (garble) stand by. Okay, I already got one
on the gate. That it didn't count.
CERNAN Okay, mark couple 20-bag dispensers.
SCHMITT Well, I was sort -- waiting for you to --
CERNAN Now, let's get this done.
SCHMITT You want --
CERNAN Here.
SCHMITT Well, what are you doing now?
CERNA I was just getting this gear out now to work
on the fender.
SCHMITT Okay.
CERNAN I'm not to geo prep yet.
SCHMITT Okay.
CERNAN Here you are.
SCHMITT Wait a minute.
CERNAN We'll just set these here.
And there's another one. Okay, SCB-7 goes under your seat.
SCHMITT Okay, I'll get that.
SCHMITT The camera has the bags on it. Just put it
there, and I'll come over and get those maps (garble).
CERNAN Okay. That goes under your seat. Let me
get four -- okay, we got 4 and 6. I'm going to start on a -- we
got SCB 4, goes to you, and SCB 6 goes on the gate yet, Jack, but
let's pick that up with geo prep, and let me get that fender gear.
Where's the --
SCHMITT It's in your seat pan.
CERNAN In my seat pan? Okay. I should have put it
over here.
SCHMITT That was just where it ended up.
CERNAN You already use the 500?
SCHMITT No, I didn't get a chance to.

CERNAN Okay, you might do it while I try the fender, then you're here to help me in case I need it.
SCHMITT No, it's all -- all your stuff's right there, Gene.
CERNAN Oh, okay, I see it. Well, let's hope it does the job.
SCHMITT Okay, SCB-7's in my seat. And, I put the return to LM map in there, too, it's just going to be in the way anywhere else.
CAPCOM Okay, copy that.
SCHMITT Let me check something, though. On the way to the Hole in the Wall, we want to drive (garble).
CAPCOM (Garble)
CERNAN Okay. Hope this thing gets stiff. It's just a flapper. Sure isn't stiff like I wanted it to be.
SCHMITT Want me to hold it there?
CERNAN Yeah, you're going to have to, I reckon.
SCHMITT But, that may do the job. Let's see, does it come over the --
CERNAN I want it about right above the axle -- let me -- let me -- wait a minute, let me align it. Okay, hold it right there. Let me get the --
SCHMITT Okay.
CERNAN Let me move it up just a little bit. Right there. Okay, hold it right there. Let me see how much room I --

END OF TAPE

CERNAN Okay, hold it right there, let me see how much room I've got coming out. I want to turn this around we can tape that other end, Jack. There you go.

SCHMITT It's tending to fold a little bit -

CERNAN I think - Yeah, but the dust will be coming up from under us. Let's see.

SCHMITT Temperature, I think is making it fold.

CERNAN Now, that'll give us plenty of room down there, that -

CERNAN Yeah, I just don't want to interfere with the steering.

SCHMITT You think that'll stop the dust that way?

CERNAN Well, it'll stop some of it if it stays on.

SCHMITT Well what I mean, it's not projecting outward at all. It's curling back under.

CERNAN Well, when I put a clamp here and a clamp here see what will happen.

SCHMITT Oh, okay.

SCHMITT Is that about where you want it?

SPEAKER Lean it against me, if you need to.

CERNAN Trying to figure out - No, I've got to clamp it right in that rail, it's not much to clamp it on the inside.

SCHMITT No.

CERNAN Keep the knob up. There you go.

SCHMITT Hold it right there.

CERNAN We got it all folded up on this side?

SCHMITT Why don't you try the outside.

CERNAN (garble)

SCHMITT Okay, why don't you try the outside, first?

CAPCOM Fix it inside first, probably be better, guys.

CERNAN Got enough overlap there.

SCHMITT Nope, I want a little more. No, I am going to try this side because I can get my overlap over here.

PAO As you can see it's only a paper fender. But the Moon is real.

CERNAN Now hold it right there while I clamp it down.

CERNAN No, that paper isn't going to come off and the clamp's not going to come off, you can see that.

CERNAN I don't know how much we're going to get on the fender but -

SCHMITT Okay that's fixed?

SCHMITT Yeah.

CERNAN Can you fix that at all?

SCHMITT Yep.

CERNAN That ought to give us a little strength,
a little stiffening.
CERNAN Yeah.
SCHMITT It tight?
CERNAN Yeah. Tighter for the road. I don't
want to loose that man that's tight. Now see if I
can get this one. Jack, why don't you come on this side and
hold the fender down right there. Hold it right about there.
Okay, you want to get it outboard a little more.
SCHMITT You mean aft.
CERNAN No, I want to keep it above this center.
The hub here.
SCHMITT Yeah, Okay.
CERNAN For steering purposes. (garble)
SCHMITT (Garble)
CERNAN I'll take a look at it. I'm going to
tighten it down so it stays and then I'm going to take a
look at it. I might turn this thing down too.
SCHMITT Yeah, I was just going to suggest that.
CERNAN Let me take a look before I get it too
tight.
SCHMITT Well, I'll tell you that's going to help
some.
CERNAN Yep. It may do the trick. I can't see
what's under this rail too well, but I know that clamp is
on. It's on tight.
SCHMITT Gene, it looks, (garble) move your left
hand a little. Okay, tighten that now.
CERNAN Get this out of the way. Looks as if
Let me get it a little bit straighter.
SCHMITT Yeah. I think you need to straighten it.
CERNAN Well I had it tight.
SCHMITT Yeah, but you know you've got another
piece in there so -
CERNAN Yeah, that's why it's crooked, it's over -
those pieces.
SCHMITT Yeah.
SCHMITT You might want to move it, - if you'd
move it about an inch you'd be past the ridge you've got.
CERNAN Well, I'm just taking John's word on
the steering. I -
SCHMITT Okay.
CERNAN Keeping it above the hub here.
SCHMITT Okay, tighten her down then.
PAO The crew's using maps to make that fender.
The clamps are from the optical alignment telescope lamp.
CERNAN I think that'll stay.
SCHMITT I think it'll stay.
CERNAN Why don't I just turn this - Okay.
SCHMITT You won't get that any tighter.

CERNAN No, I mean, why don't I turn that down so it'll keep that much less to run into. There you go. No, not too close to that wheel. Okay?

SCHMITT I think that's good.

CERNAN Too bad we don't have one more clamp, well, one more clamp would probably interfere with the steering. I think that'll stop the rooster tail, because that's swinging forward.

SCHMITT I think it'll stop a lot of it Houston

CERNAN Okay, let's go.

CAPCOM Okay, it's ah -

CERNAN The maps are configured.

CAPCOM That's a good attempt men. We well hope it works.

SCHMITT Does that look good, John from what he did.

CAPCOM It looks exactly what he did he says.

CERNAN That tape will keep it - yeah but he didn't run in the dust so I guess we'll have to give it a trill run.

CAPCOM Roger on that.

CERNAN That ought to help some

CAPCOM We're anxiously waiting.

CERNAN Okay, Jack. I'm going to highs for a little bit. Okay, (garble)

SCHMITT It's (garble) now i'm on 4.

CERNAN I took 8 off.

SCHMITT No sir, I want 4 and 6.

CERNAN Why don't you just substitute - say I just took 8 off. Can we use 8 instead of 6.

SCHMITT Yeah, we can.

CAPCOM Yeah, I don't see any reason why you shouldn't be able to use that, Jack. Go ahead. We'll just mark it down.

CERNAN Okay, turn around Jack. Hey, Bob we'll use 8 instead of 4.

CAPCOM Okay, understand 8 will be on the -

SCHMITT 8 instead of 4

CAPCOM 8 will be on the LMP.

CERNAN Then it's affirm 8 will be on the LMP.

CAPCOM Gene, you went to MIN instead of MAX.

CERNAN I think your right, I just realized that.

CERNAN Got it.

SCHMITT Yep, let me go to max here, for a minute.

CERNAN We need 6 off of there, Jack.

SCHMITT Oh, your 5 stays back here, huh.

CERNAN We need 6 to the gate.

SCHMITT It's probably behind 4 isn't it.

CAPCOM Well, then put 4 on the gate, then guys

CAPCOM and put 5 on the on the Commander.
SPEAKER Yeah.
CERNAN Okay, 4 is going on the gate and 5 on
the commander. Okay, Bob, a little paper work for you, but
that's all right.
SCHMITT Okay.
SPEAKER Now I got to do some more stowing when you
get that on.
CERNAN Okay.
SPEAKER Okay They're in the ...
CERNAN Where you want me.
SCHMITT Your left side.
CERNAN Any word Houston? Okay you going to turn.
Oh, man, that Velcro get tough.
SCHMITT Here you've got a core cap dispenser.
Stand by let me fix these for you over here.
CERNAN Okay, here's your dolphin harness on
this side. Don't move yet, I've gotta - I've got something
I've got to do to you.
SCHMITT Okay. Okay.
CERNAN Okay, turn around and I'll get your
harness on the other side.
SCHMITT Let me get yours too. Okay, there you
go. Okay you've got a CAP dispenser, you've got a rammer
and you've got - Well, I guess that's (garble).
CERNAN That's all right they got it. Okay,
that's 1
SCHMITT Okay.
SPEAKER You can give me SCB 5 then, and -
CERNAN Can you move a little bit, there you go.
CERNAN Okay, there you are.
SCHMITT You got it?
CERNAN No - No, I'm sorry. In fact, I've got to
tighten up here.
SCHMITT We've got to take a picture of that
fender if it works.
CERNAN Nope, wait a minute. If you weren't so tall ...
you are always saying ... invariably stands, so I have to get
in a hole. Okay, now let me tighten up your whole shootin
match. Loose again. Hang on. Okay. Between Velcro and snaps,
the world could never fall apart. Okay.
SCHMITT All set.
CERNAN You're set.
SCHMITT Okay -

END OF TAPE

APOLLO 17 MISSION COMMENTARY, 12/12/172, 18:12CST, 141:19GET, 552/1

CERNAN Okay, All set?
SCHMITT You're set.
SCHMITT Okay, I'll get a hammer and then I'll get the
TGE.
CERNAN Now I'm going to get my camera and I'll go
to the SEP site.
SCHMITT Okay, why don't you go to the SEP site.
CERNAN Hey, Jack what it says we ought to know.
SCHMITT And also, I presume that the dust brush is
on the rover now.
CERNAN It is.
CAPCOM Okay, copy that.
CERNAN Jack, when I drive out there why don't you
watch the rear wheel.
SCHMITT I will.
SCHMITT Give me a yell when you start to drive.
CERNAN Okay, both the steering and the rooster tail-
it's not all zeroes. Okay, Bob, 670 017 701, 670 017 701.
CAPCOM Okay, copy that.
CERNAN Okay and the SCB is good. It's closed. It's
in the shade. The rest RC I guess.
CAPCOM Okay. And Jack, when you get out to the SEP
site, you might give us a reading on what the solar panels look
like - how they survive the night with the tape on them.
SCHMITT I wouldn't think of not doing that. I'm cur-
ious myself. Okay, the TGE is on the LRV.
CAPCOM Okay, copy that.
CERNAN Okay I'm making inventory I've got the LCRU
battery. Okay we got 13 and 218 the crew blankets are open
100 percent. Battery covers are closed. Dust pressure is on
the LCRU. PG is on the rover. Jack, can you verify we got the
right mag to the polar solar?
SCHMITT Yes, today, I verified that.
CERNAN Okay, very good. Better put that 500 back
under the seat.
SCHMITT Yeah, that's where it's going.
CERNAN Well, Bob it looks like it survived. There
is a - as I stand behind the panels - the left hand panel maybe
tilted at about - well less than 5 degrees, probably about 2 or
3 but that's all. Looks pretty good right now.
CAPCOM Okay, beautiful. Thank you. Good thinking.
CERNAN Okay.
SCHMITT Okay, Bob I'm going to take the TV from you.
CAPCOM Okay copy that.
SCHMITT To see what is going on.
CAPCOM Copy that Jack.
SCHMITT Ha, ha, ha. I can do without destroying it.
CERNAN Yeah, that's hard to do out there Jack.
SCHMITT Okay, TV camera go on position 1. Track bed
is on and -

APOLLO 17 MISSION COMMENTARY, 12/12/72, 18:12CST, 141:19GET, 552/2

PAO We'll loose the TV while Gene Cernan drives the rover to the surface electrical property site.

SCHMITT Well, the noman has moved a little bit, but not much, but you would expect that I guess.

SCHMITT Yeah, seeing the other end of the noman up there in the sky moved little bit.

CERNAN Yeah, that's what I said.

CERNAN Okay, camera tongs and I'll drive. West leg 8270.

PAO That site is 100 meters east of the lunar module - Jack Schmitt has just walked out there and turned on the SEP transmitter.

CERNAN I guess 26.

CAPCOM Okay -

CERNAN Frame 27, mag, Charlie.

CAPCOM Copy that and Charlie 26. 27.

CERNAN I had to relearn how to document samples, Bob. I just have - the first part of my roll will have a lot of random exposures and focuses.

SCHMITT Okay, we're back in business. And while I'm waiting for Gene getting a rock - it looks a little finer grain than the others we've seen in the LRV sampler, along with the soil. And that's done. Hey, that's a neat sampler. Only way to fly. Okay, and that's in bag 22E. It has the stereo documentation and a locator to the LM and it's about 2 meters from the S - from the SEP.

CAPCOM Okay, Jack.

SCHMITT 22 ECO.

CAPCOM Roger, copy that. Did you ever find any sign of that brown fine grained rock you saw on the way out to the SEP yesterday?

SCHMITT Bob, let me give you some readings so I can get going.

CAPCOM Okay, go ahead Geno.

CERNAN Okay, amp hours 100, bolts are 68 68, batteries are 80 and 102 and motors are all off scale low. I'm on the way. On the way, Jack. I'm waiting. Oh, there you are over there.

CAPCOM And Jack how's the rooster tail look on that fender?

SCHMITT Looks like it's going backwards. I don't see any coming up over the top. Looks like a good fix.

CAPCOM Beautiful.

CERNAN Okay, Jack, I got to come around - I'm going to come on this side and head west.

SCHMITT Okay, watch for - you got the antennas?

CERNAN I've got one over here.

SCHMITT Okay, I'll give you a line on the other one.

PAO That rooster tail is a cloud of dust that the Rover's rear wheel throws up.

CERNAN Okay, I'm getting close.
SCHMITT Okay. Where - where is it? I'm right here.
CERNAN Okay. Okay, and I see the other one right parallel to that line.
CAPCOM Low gain Gene please.
CERNAN I guess that's about two or three meters, huh, Jack? You could see where it is at.
SCHMITT That's good, Gene-o.
CERNAN Okay, heading 270. Are my 10 meters on the transmitter?
SCHMITT Probably not, huh. Ah, you're pretty. Now you need to go about 5 meters.
CERNAN How far am I? See if it's okay.
SCHMITT You're about 3 meters - 4 meters.
CERNAN Hey, Bob, I'm 3 meters west of the transmitter and about 2 and a half meters south of the (garble).
CAPCOM There's no problem there, Gene. Don't move. It's just that it has to be less than those numbers.
CERNAN Okay, that's where I am.
SCHMITT Okay, I'm getting your photos.
CERNAN Okay, let me get my voltage reading and I'm still reading 68 and 68.
CAPCOM Okay, copy that. We don't need those, we just got them. And give me the NAV numbers.
CERNAN I just wanted to keep you on it.
CAPCOM NAV numbers and just give us some NAV numbers.
CERNAN Okay, 265 02 and 01.
CAPCOM The heading - we want heading pitch, roll and sun dial later on, Gene.
CERNAN Okay, I'm sorry, Bob. Okay, you want a Nav update here?
CAPCOM Nav initialized.
CERNAN Yes sir, you do.
CAPCOM Roger.
CERNAN Yes sir, I'm sorry.
CAPCOM Go to the next page.
SCHMITT Let me change my position at the scope.
CERNAN I knew you - Bob, what was that last LRV sample number I gave you?
CAPCOM 22 Echo.
CERNAN 23 Echo, if that follows the sequence. There's another rock about near the SEP documented the same way.
CAPCOM Okay, copy that.
CERNAN Okay, Bob, 265.3.1. Roll is 1 right, pitch is zero and the sun shed device is zero. I'm heading 281 degrees.
CAPCOM Okay, copy that. Stand by.

END OF TAPE

SCHMITT Okay, the recorder is ON, and the receive power switch is ON.

CAPCOM Copy that.

CERNAN And I guess you're going to hand me EP4 Get rid of this.

CAPCOM Okay. 282 is the preferred but that's to small to bother the torqueing, Gene, you're good as is. We're ready for you guys to go.

CERNAN Okay, that looks good cause I have to come left just a schosh there to proceed parallel down the west line.

CAPCOM Okay. We're ready for you guys to go. We presume you have the SEP MODO's, Jack.

SCHMITT Yes, I do.

CAPCOM Okay, and get your frame - we don't need - you can give us a frame count if you want. Remember to pick up EP4 when you get in the Rover.

SCHMITT Good. Okay, we got it and the frame count is 17.

CAPCOM Copy 17 for the LMP and we need a NAV reset to verify there, Gene.

CERNAN I didn't have reset. I'm reading all balls.

CAPCOM Okay, and did you happen to check the

CERNAN And it is back off.

CAPCOM SEP temperature when you turned it on, Gene? Jack? The receiver?

SCHMITT No. I didn't, I didn't. Doubt if it changed much since I called you.

CAPCOM Okay, we'll catch it at Station 2.

CAPCOM Okay, low gain antenna is 240 and we're ready for you guys to leave.

SCHMITT (garbled)

CAPCOM Give us a mark when you leave.

CERNAN Okay.

CERNAN Here we go. Jack, leaving. The SEP antenna receiver, receiver antenna, both out.

SCHMITT Yes, sir.

CERNAN Okay, (garbled)

CAPCOM Okay, and Gene, we want a mark when you pass the end of the antenna.

CERNAN Okay.

SCHMITT Drive fairly slowly. Huh?

CERNAN Yeah, until I get past the end. I got to get my heading changed about 10 degrees to parallel. We still have the same relative position, Bob.

CAPCOM Okay. Very good.

CERNAN Okay, we are moving right now.

CAPCOM Okay, we're marking that.

CERNAN Slowly.
PAO The crew has started for Station 2 the most distant of the stations. More than 7 kilometers away.
CERNAN Mark it.
CAPCOM Okay. Copy that.
CERNAN Yeah, we going to go past Lava heading 260, Jack.
SCHMITT Well we want to get at 080 0.4 and get rid of this charge. Okay.
CAPCOM Okay, and give Gene a couple of words there as you drive along, let me give them to you early here. One we didn't bother to change all the numbers on the checklist but by and large because we think we're 200 meters east of where we were. You should probably increase all those numbers except for the explosive package numbers by about two-tenths to get the distance at which you will come across these areas. Again it's about 0.4, 0.5 and we expect to deploy EP4. The more important number though is that it's 0.2 west of the ALSEP. As you pass the ALSEP you might know what the range and distance are reading at that point.
CERNAN Okay, Range is the one that changes on - no wait a minute, that - I got it.
CAPCOM Roger.
CERNAN Which is it the range changes every half - on the half kilometer. Distance.
CAPCOM Roger, Jack. The range is what changes in the middle at 0.53 yards and 150 meters.
SCHMITT Okay, read, the fender fix is working so far.
CAPCOM Beautiful.
CERNAN Let me get around your flag. There's your flag way out there isn't it.
SCHMITT Yeah. You can get around that.
CERNAN That's really giving the ALSEP some room.
SCHMITT Yep.
CERNAN Okay, Bob, we're still seeing the light colored gabbroic rocks. I think the reason I said 50 percent was because in this light they look light colored and that's probably larger because of the dap-fit halos.
CAPCOM Okay I copy that.
CERNAN In the Badlands they'd look like standard gabbro.
SCHMITT And Bob, I'm full ot at about 11 -
CERNAN You can turn right now.
SCHMITT I'm full out at about 11 clicks right now.
CAPCOM Beautiful.
CAPCOM Gene give me a call as you pass by the ALSEP and get ready to deploy the charge, please.

CERNAN Okay, we're almost due south of the ALSEP now.
CAPCOM Okay, copy that. Go about 0.2 kilometers
further than that.
SCHMITT (garble)
SCHMITT A little rocky out here.
CERNAN Yeah, it sure is.
CERNAN Every - in the area we are now you get a
distance that was -
SCHMITT Okay, we just clicked a 4, I wanta move
over this way just a scosh.
CAPCOM Yeah.
CERNAN Just south of my geophone 2 flag now.
CAPCOM Okay, if you just click the 4, let's go
to 6 then just past the click on 6.
SCHMITT Okay, and you want about 080?
CERNAN Plenty good enough. I got to start
heading right out here, right toward my
SCHMITT Upper graphic -
SCHMITT Okay, Hole in the Wall should be just
to the left of the notch.
CERNAN Yep. That's exactly where I'm heading.
SCHMITT And I think we're coming up closer to
the rim of Camelot. It's starting to look like a crater now.
CAPCOM Okay, very good.
CERNAN Looking down sun I see no major albedo
changes except for the very fresh craters which are brighter.
By a few, by a, maybe 20 percent. The surface -
SCHMITT How are we doing.
CERNAN 5. Okay, Bob, here's your charge. Take
a spot check.
SCHMITT Okay, can you swing right out over there
about 10 meters ahead.
CERNAN Okay, give me a shallow turn.
CERNAN How's that?
SCHMITT Okay, and I'll right there on that, in that -
SCHMITT Can you move forward and I'll get it in
that little depression.
CERNAN Okay.
SCHMITT You see on the other side of the rock.
CERNAN Yep.
PAO This charge is one-eighth of a pound.
CERNAN Okay, Bob, 083.6 at .5.
CAPCOM Okay, copy that.
SCHMITT Okay. Pin one. Pulled and safed. Pin two
is pulled and safed. Pin three pulled and safed.
SCHMITT Did you ever stop and ask yourself what
I'm doing.
CAPCOM Copy that Jack. You can give us a frame
count, we'd appreciate it. And might remind you two to both check
(garble) since you've got a long drive ahead of you there.

SCHMITT Hey, I lost my sample (garbled)
CERNAN Threw it on the floor?
SCHMITT I hope so.
PAO That charge due to detonate 90 hours
45 minutes after it was deployed.
SCHMITT (garbled)
CERNAN Got anything to tell us -
SCHMITT I'll do a partial for you.
SCHMITT Yeah, we got to do a partial. I'd like
to know where that sampler is. Well, I'll do without it I
guess.
CERNAN Yeah. Sure would be nice to - where did
you come off. The end?
SCHMITT Yeah, I think I can check it.
CERNAN Get your pad.
SCHMITT Yeah. If you go around - to seeing that
big block there by the ALSEP, then you can - forget it.
CERNAN Okay.
SCHMITT Okay, just come around and I'll pick up
my tracks.
SCHMITT Do you want to get that sampler?
CERNAN Can you see it.
SCHMITT I think I'd better look.
CERNAN Bob. One stop here for about 2 seconds.
CAPCOM Copy that.
PAO The station ---
SCHMITT Down there. Why don't you put it on real
quick and
CERNAN I don't know why it was hard to put on.
Surprised it came off
CERNAN Here let me. Let me hold the end.
SCHMITT See you got to get 'em retracted - retracted
CAPCOM They'll retract. And let me know when.
SCHMITT Okay.
CERNAN Okay, it's loose. Retracting.
SCHMITT Retract it again.
CERNAN Okay retract it.
SCHMITT Don't - let go, let go.
CERNAN No, it's just about.
SCHMITT Okay, try it -
CERNAN Push it in once more.
SCHMITT Okay. The best I can do. I'll put the
(garbled) on there. Maybe it'll hold.
CERNAN Okay, twist it tight.
SCHMITT I got the rod.

END OF TAPE

CERNAN Okay, I'll just have to be careful. Okay,
I've got it.
SCHMITT Get a hold.
CERNAN I've got it.
SCHMITT Okay.
CERNAN You don't have to put it in - push down.
SCHMITT Okay. Okay let's go. Everytime you
pick your seat belt up carry it it's not twisted now.
SCHMITT Okay, you all set?
CERNAN Just about.
CAPCOM Okay, Jack a reminder we'll still reading
you on intermediate you probably want to go to min before you
get back on.
SCHMITT He's back on now, and we're rolling.
CAPCOM Okay, copy your moving.
CERNAN Okay, let's go to hole-in-the-Wall. Yes
sir.
CAPCOM Okay, one other thing I might mention to
you guys is your driving here, Jack, before you start talking
again. Is that as you go by Camelot you might keep an eye
out for blocks along the rim there. Because you may be wanting to
come back and move station five to an area where there is
blocks unless there are blocks at the present nominal station
five so you might keep an eye for that and plan for the
way back. A second thing a reminder if you do stop for a
rover sample that are one thing or another along the way
give us a call and keep us informed because we're timing you
on the way out and the assumption is, of course, that driving
time out equals drive back time, and we're under a 63 minute
limit to get you from the LM out to the station 2 because of
OPS drive back. So keep us informed so we can keep a good
tab.
SCHMITT Okay, Bob. Okay, we'll keep you informed.
Bob, I got the thing two blocked and I'm averaging probably
10 to 11 clicks. It's not exactly straight line navigation
but I think I can hold most of it.
CAPCOM Roger beautiful.
CERNAN That's great there you go.
CAPCOM And, Jack a reminder -
SCHMITT When Gene decides to turn.
CAPCOM Jack, a reminder on photos yesterday you
apparently took quite a few on the way back from station one to the
sep and we're right nominal on budget now, but considering
the fact that we didn't do much sampling you continue to
use them at the rate you did yesterday going back from
station 1 at least we understand you'll be pushing us pretty
hard in the budget. Should be every fifteen meters or every
100 meters.

SCHMITT Bob, okay and you want to hear something.
CAPCOM Roger, I'll listen now.
SCHMITT Okay, the surface is not changing in terms of the detail. The surface texture of the fine grained regolith still there is a raindrop pattern. We're more - the block still look very much like what we sampled yesterday around the LM. Their light colored fairly gabbros with zap pits - zap halos. Occasional craters show lighter colored ejectas both all the way down to say half a meter in size. Other craters that are just as blocky as those with bright halos to have no brightness associated with them. Most of the brightest craters have a little central pit in the bottom which is glass lined. The pit is maybe a fifth of the diameter of the crater itself. It's a very standard thing for most of these fresher craters is that little central pit. Okay, we're just south of the rim of Camelot. There is a light mantle on the other side. Look at that crater. Woo We've got the - oh, and there's Camelot. Oh Manechevitz woo Take a couple of pictures looking at that.
CERNAN Okay. Can you frame a little.
SCHMITT Yes. Okay, I got them. That is a 600 meter crater.
CAPCOM How about a bearing range to help us pick out the (garble). Rog, how about bearing the range and then we'll pick out the (garble).
SCHMITT Okay 0831.2 and 1.0.
CAPCOM Okay, thank you.
CERNAN Okay, now that's a little (garble)block.
SCHMITT Now that little crater in the ejecta did not - of Camelot at least the rim of Camelot did not bring up the blocks on the rim. It may have been an old depression. Bob, there is extremely blocky area. This - I think station five was over there where that block area is. The light colored area on the photos are essentially blocky. They're probably 30 percent blocks. All of them or many of them are in the 2 to 3 to 4 meter size range. All of them look light colored look like the gabbro we sampled from a distance. They have light halo zap pits on them. I see only occasional grayer varieties which I believe are the non-vesicular ones like we also sampled.
CAPCOM Okay, copy that, Jack very good.
SCHMITT The light colored gabbros are dominant.
CAPCOM Thank you.
SCHMITT Okay, station five would have been rather than in a light colored area was in a very blocky area. Station five is probably still very good for blocks.
CAPCOM Okay, thank you.

SCHMITT There is probably as big blocks there as anywhere on the rim that we've seen.

CAPCOM Copy that.

CERNAN Okay, we ought to be going really between Horatio and Camelot.

SCHMITT No, I'm going to give them a call when we're due south of Camelot and see if they can't get a position on us.

CERNAN Hold it Jack watch it hold it hold it. You can go around that one. You bet you. I suppose it's beat up a little bit.

SCHMITT You can un wrinkle your toes now.

CERNAN Okay.

SCHMITT Oh, I wouldn't worry, Gene. Watch that block there it's probably more than 14 inches. And got a fairly close look at the rock and it is the vesicular - looks very much like the vesicular line appearance like gabbro.

CAPCOM Thank you.

CERNAN Now, the surface of Camelot is mantel or the rim is mantle with the same dark gray material and it has the same surface texture - a very fine raindrop pattern. The saturation crater size does not look bigger than a half a meter at that. OkayBob, I'm going to give you 0811.6 and 1.4. We're south of the center of the center of Camelot.

CAPCOM Okay, thank you Gene.

CERNAN One crater - okay, we ought to see the Horatio here pretty quick.

SCHMITT I think it's right up in front of us.

CERNAN Yes, I think your right.

SCHMITT We can definitely see the light mantle as it comes out over the valley here and we're looking at Hole-in-the-Wall although it's still too subtle. We're looking right at Lara as a matter of fact.

CERNAN Yes, there is Lara very clear and Hole-in-the-Wall you can see it.

SCHMITT Yes. There's Horatio way over there where those blocks are. See it?

CERNAN Yes, that's Horatio. We're right on course sir. There's a little depression we didn't talk about though between Horatio and Camelot, but it's a depression and not a blocky crater at all. As a matter of fact the total block population has changed out on the - once we get away from the rim of Camelot block frequency is quite a bit smaller. It's down maybe to only less than one percent of the surface.

APOLLO 17 MISSION COMMENTARY 12/12/72 CST 18:32 GET 141:39 554/4

SCHMITT Much easier driving with the
rover?

CERNAN Boy, am I glad we got that fender on.
Very obvious that the rover navigation because of the blocks and
because of the smaller (garble) craters and very subtle type
craters that are in this area. There are up to 2 meter bright
halo blocky craters and that's blocky wall craters that
may be instant rock I think it is rather than bedrock in the
rim area of Camelot.

SCHMITT Horatio has got to be - there's Horatio
right there.

CERNAN Yes, that's Horatio.

SCHMITT Let me - -

END OF TAPE

CERNAN That's got to be Horatio there.
SCHMITT Yeah, that's Horatio.
CERNAN Let me give another mark on the southern rim of Horatio.
SCHMITT The scarp looks very smooth from here - no obvious outcrops at this time. Don't seem to be penetrating to any bedrock in the area we're traversing now just to the southeast of Horatio. Horatio has a blocky wall, however, the upper several tens of meters probably of rim looks as if its either mantle or composed of the light gray regolith material we've been driving on. The blocks do not come to the rim of Horatio.
CAPCOM Okay, copy that, Jack.
CERNAN (garbled)
SCHMITT Horatio has quite a different appearance than Camelot. It is - that's the main one - the blocks do not get to the rim.
CERNAN What's your roll. (laughter)
SCHMITT I know its not much but it seems like a lot.
CERNAN We've got to go around that crater.
SCHMITT It looks like - if Horatio is any gage, the rim thickness, maybe, this is a wild guess, Bob, but maybe an average of 20 or 30 meters (garbled) thickness lies above the exposures of the subfloor, exposures being blocks in the wall. And some of those blocks again are several meters, if not 5 to 10 meters in diameter. And they're concentrated on the west rim that I can see.- there are very few blocks on the east - excuse me, the west wall, but very few blocks on the east, north or south walls of Horatio.
CAPCOM Copy that, Jack.
CERNAN Okay, Bob, we're on the southern rim 078 2.3 and 2.0.
SCHMITT Yeah, we're maybe a hundred meters south of the rim. Actually, we're on the rim crest. We're a hundred meters south of the break and slope into the crater.
CERNAN It's a lot a - It's an undulating, hummocky traverse terrain in here, Jack. These little craters make it bumpy, but other than that its really smooth sailing.
SCHMITT That's right. This is what I sort of expected dark mantle to look like rather than what we landed on. Not more than one percent of the surface and that percentage continues right over the rim crest of Horatio down on the wall until you hit the big blocks.
CERNAN What's this depression? That's not -
SCHMITT No, we're not to Bronte yet, I don't have any -
CERNAN No, we're not to Bronte -
CAPCOM Okay, 17, and how about an amp and a mobility - a speed reading.
SCHMITT I've been pushing anywhere from 9 to 11 clicks and most of the time its full out and amperes are about to around 100 apiece.

CERNAN Hey, watch these bouncing (garbled) hard to see.

SCHMITT I know they are.

CERNAN We're climbing Jack, because I've been full bore most of the time and all I can get out of this is 10 clicks and when I decelerate I decelerate in a hurry. What's our next stop here, a sample at 3.9.

SCHMITT A - 08 03.9.

CERNAN Well, I'm sitting on 080 right now and 2.6. I think we've got to add a little bit to that. (garbl)

CAPCOM Okay, stand by, we'll get a new correction for you guys on that shortly.

SCHMITT Okay, Bob. The surface is not changing, we see no craters that seem to penetrate into bedrock out in here - that is with blocky rims and that is quite a contrast to the area we sampled at station 1A yesterday. I see - I cannot see from my field of view any blocky rimmed craters. There are slight craters with fragmental walls and rims but it looks like instant rock rather than the subfloor material.

CERNAN Jack, can you see over there to the left, I'll turn a little bit - on the dark area of the south massif where you get those impressed radiations - see them going from left to right?

SCHMITT Yeah, I see what you mean, right.

CERNAN That's what I saw out my window.

SCHMITT Yeah, they go obliquely up the slope.

CERNAN They're more like wrinkles, they're - linear wrinkles.

SCHMITT Yeah, craniallations, you might say, in the slope that look something like those I saw from orbit - looking in the shadowed area - at the edge of the shadow. Bob, we see craters as much as 20 meters, maybe 30 meters diameter without blocky rims.

CAPCOM Copy that.

SCHMITT The rim block population is not much dif - The rim block population is not much different than the average for the terrain in here..

CERNAN Boy, I'll tell you, if we can't recognize the change in that albedo when we get under that white mantle I'm going to be surprised.

SCHMITT Mark my words. Okay, the light mantle is just what Gene has said, its a - that's it right now - there are some very bright craters in it they stand out, bright haloed craters scattered over it that seem to be quite a bit brighter than anything we have out here on the dark mantle.

CERNAN See those blocks over there? That's the first different colored blocks I've seen, they're sort of grey looking.

SCHMITT Where are you looking?

CERNAN Over to the right a little bit.

CERNAN Darker grey - a little bit.

SCHMITT Watch yourself here. Okay, there's a crater with a big mass of block in the bottom. It looks like there might be a secondary fragment from somewhere.

CERNAN Do you want to get a photo as we go by?
SCHMITT Yeah, let's - can you swing a little bit
to the right?
CERNAN That might be worth a -
SCHMITT How's our time for traverse, Bob? Do we
have time for an LRV sample?
CAPCOM You're doing great, so far. We're looking
for our first LRV sample at about 4.2 - that's in the light
mantle. If you can do it quickly - but its - a - we weren't
planning on it.
CERNAN Yeah, lets get -
CAPCOM (garbled) opportunity there, Jack.
SCHMITT Can you get -
CERNAN Yeah, go ahead -
SCHMITT Okay, swing a little bit to the right now.
CERNAN Okay.
SCHMITT Right up across that little raise..
CERNAN Okay.
SCHMITT And I'll try to get a chunk of whatever
I want - keep going - keep going -
CERNAN Hey, that big place there -
SCHMITT Whoa, whoa -
CERNAN Let me get the switch off.
SCHMITT 082 3.0 2.6
CERNAN And Bob, I've been making a 10 to 12
clicks coming across the surface and as I say, for the most part,
that's full bore except where I have to do some rapid changes.
CAPCOM Okay, and by and large, the back room is inter-
ested in you guys pressing on to station 2.
CERNAN Okay, we are.
PAO That's 10 to 12 kilometers per hour.
The crew -
SCHMITT Okay, Gene. That's a pretty big rock in
there.
CERNAN Okay.
SCHMITT And Bob, I think -
CERNAN Hold it.- Hold it down further - down.
It's got quite a bit of dirt in it.
SCHMITT I think this is a sam - this is a block from
a linear strewn field of very irregular and jagged rocks that
are - that are southwest of the - of a crater that's 10 to
15 meters in diameter. It - it looks like the material that
may have formed the crater and you can look at some of the
pictures and make your own decision.
CAPCOM Okay, copy that.
CERNAN Can you get it in there? Okay, you got it.
SCHMITT Oh, no I didn't.
CERNAN No?
SCHMITT The bag is not open.
CERNAN Well, okay. Yeah, that's bad.
SCHMITT Did you push it in?
CERNAN Okay, hold on.
SCHMITT Okay, now. - 26 echo, Bob, Bob. We're
on our way.

APOLLO 17 MISSION COMMENTARY 12/12/72 18:40CST 121:47GET MC555/4

CAPCOM Okay, copy that.
CERNAN Wait a minute.
CAPCOM Have you got a frame count, Jack?
SCHMITT Oh yeah. Let me - and I did get my
locater here.
CERNAN And I've got mine.
CAPCOM Thank you, Jack - Gene.
SCHMITT And the frame count is 95.
CAPCOM Copy that.
SCHMITT Holy cow. I'd better slow down my picture
taking.
CAPCOM Roger, Jack.
SCHMITT (garbled) where the fragment population
may be up to 3 percent - its getting a little more like what
we saw around the LM. In fact, I would say it was comparable
now.
CERNAN I'm going down this slope and up the other
side now, Jack.
SCHMITT But nothing like station 1.
CAPCOM Okay, copy that. And the next planned
Rover sample will be at a distance of 4.2 so 080 and 4.2, and
it will be in the light mantle it's (garbled) degrees at those
numbers.
CERNAN Okay, we copy, Bob. Okay, its in the
first part of (garble) mantle as I recall. Is that right?
CAPCOM Roger, the (garble).
SCHMITT Okay, Bob. your heading at 260 looks like
its right on, by the way, from what I see on the skyline.
CAPCOM Okay. And how's the low gain antenna holding
up?
SCHMITT Well, I'm moving it so I guess you getting it.
CAPCOM Yeah, we're getting it - just checking.

END OF TAPE

SCHMITT Bob, I still - the blocks I see seem to be the gabbro. Except for that one sample we took which I hope was what I thought it was - was the -

CERNAN Oooh, that's a big crater. We got to get around here.

SCHMITT Okay.

CERNAN That must be Bronte. My God, is that big. That's bigger than I expected. I got to go around this thing.

SCHMITT Yeah, yeah.

CERNAN There are some very very -

SCHMITT (garble) rocks, rather than the normal gabbro that we've seen, are very - have very large egg-size vesicles in them.

CERNAN Watch it - you got one right there -

SCHMITT I got them. I got - don't mind me, Gene.

CERNAN No problem. That's alright. There some of them are hard to see.

SCHMITT I want to get off this slope. Wonder if I took a picture of that rock deal? I hope I did. Getting to be so automatic that I'm not sure what I'm taking any more.

CERNAN Okay, I'm going to go through this niche between a high point in the saddle here.

SCHMITT Okay.

CERNAN How does it figure, Bob? I think we're north of Bronte. Does that figure?

CAPCOM Roger, that seems to be right about where you should be on the map. Okay, you still need to be navigating a little bit. Time's dropping out from time to time.

CERNAN Yeah. 2.8, 3.5 and 2.9. We're on the north side of Bronte and it looks like Bronte has penetrated the dark mantle in here, it got the subfloor.

SCHMITT There's not an awful lot of blocks around the rim, just some small ones, compared with what we saw around - watch it.

CERNAN Yep.

SCHMITT With what we've seen around Horatio, the walls of Horatio and around Camelot. Nothing at all like we saw yesterday at station 1. Bob, that characteristic little dimple in the bottom of the craters is still with us and it's invariably glass-lined in the fresh ones.

CAPCOM Okay, very good.

SCHMITT Now, that's not a complete lining. It just seems to be glass - a group made, if you will - that's holding the fragments in the bottom of the crater together. There's one on the side of an older crater. We're back in about a one percent coverage. I suspect that the reason we are - the block population went up there was because of Bronte.

CERNAN There are an awful lot of these smaller glass-lined craters around.

SCHMITT Yeah, and you notice, Gene, what I was saying about the little dimple in the bottom.

CERNAN Yeah.

SCHMITT Watch the fresh ones and they all have that little dimple as if that ...

CERNAN You see there's one right there.

SCHMITT Yeah, right there. Man, you can predict it.

CERNAN Jack, You know, I think the white mantle is starting right over there. See on your right?

SCHMITT Yeah, that's the first -

CERNAN The place you really can see it is reflected off of the - close to the slopes of the sl -

SCHMITT Yeah.

CERNAN Of the cliffs out there, but I think -

SCHMITT I hate to say it, but Charlie may be right.

CERNAN Well, you know, if one thing that may distinguish it is the bright halo craters are brighter.

SCHMITT But I can see it from here.

CERNAN Yeah, on the floor of the valley here.

SCHMITT Yep.

CERNAN On the scarp it really shows up.

SCHMITT The block population is unchanged, still appears to be a - well, I can see large enough blocks - appears to be the gabbro, although they're not as much to look at now as during the blocks. The surface characteristics have not changed. There are no craters that we see that are bringing up clear blocky rims. There's a - most of the fresh craters have instant rock around them. The craters are the same size. They are older and more subdued. That instant rock is apparently broken down. I suspect a small vapping break that down fairly quickly.

CAPCOM Okay, 17, copy that. You can still make it in about 9 to about 11 kilometers.

CERNAN No sir, I've been making it for 10 to 12 Bob - mostly 12.

CAPCOM Okay. Could you give me a reading on the Amps this time, Gene-o.

CERNAN Stand by, I've got a little navigating to do.

CAPCOM Okay, stand by.

CERNAN Okay, I read - I'm reading - I'm reading 100 - bustin around 100 on both of them.

CAPCOM Okay, how about amps and not amp hours?

CERNAN This was - oh, I'm sorry.

SCHMITT Watch your - you've got to hold them - ooh, there you go. Spun around a little bit. Here, let me get - Good vehicle you got here.

CERNAN Yeah, it takes a little getting used to, though. Bet you wouldn't want to go through many of those.

SCHMITT Nope.

CERNAN Okay, Bob, I'll give you an AMP reading as soon as I can. Just stand by for it.

CAPCOM Alright, there's no hurry. Don't worry

SCHMITT Would you believe my camera handle's coming off?

CERNAN The terrain gets a lot more locally hummocky with some - some well rounded rims but very large aspect ratio craters you got to get around in here - in the 4 or 5 meter size.

SCHMITT Charlie - Charlie - I was thinking of white mantle. That's the white mantle we're coming up on right up here.

CERNAN Yeah.

SCHMITT See that on your right?

CERNAN Yeah.

SCHMITT That's it, it's not going to be that much different. Ooh. Not going to be that much different but - look where you're going. I gotta watch I don't lose my camera. It's come loose.

CERNAN See, now you're going to see where we come up on that white mantle. It's dusted with that light - light - look at it.

SCHMITT Yeah.

CERNAN We're only a 100 meters from the light mantle.

SCHMITT Well, we're coming -

CAPCOM Okay, how about giving us the range and bearing when you get to it.

CERNAN We're coming up on it now.

SCHMITT Yeah.

CERNAN There certainly is a change in the general albedo, particularly in the crater. The craters are much brighter in their walls than we've seen before.

SCHMITT Yeah, that's a -

CERNAN Although there's still a brown - a light gray dusting over the top of it in here, but it's clearly different - no buts about that.

CERNAN You can't see the contrast when you cross it but we know we're coming into something lighter - (garble)

SCHMITT We ought to sample the rim of one of these craters when we get our LRV sample because that's what's distinctly lighter.

CAPCOM How about a range and bearing, guys?

CERNAN We're at 3.8 here and we can sample that rim -

CAPCOM Copy the 3.8.

CERNAN 0834.4 and 3.8 I didn't (garble).

SCHMITT How about right over there, Gene-o? Could you get on the rim of that crater?

CERNAN Right here?

SCHMITT No, right to the right there. Right here - that light stuff. See where the big crater is?

CERNAN Yeah.

SCHMITT See the big crater there and the light material' on the rim?

CERNAN Yeah, I can get there. But I'm gonna have to not give you much of a turn because I -

SCHMITT That's all right - I got the pictures. Now, if you swing to the left a little bit and then back - whoa

Now, back right. Okay. Hope my camera stays on there.

CERNAN You like that?

SCHMITT Yeah, whoa, whoa.

CERNAN Okay, Bob, we are at 0834.4, at 3.8, and I been running about 20 to 25 amps, I think, on both.

CAPCOM Okay, copy that.

CERNAN We are in a light mantle. It's not a contrasting light like you might expect, like we're looking at on the scarp as the sun shines on it, but I don't think there's any question.

CAPCOM Okay, beautiful.

SCHMITT The craters are very definite - the penetrate into it are definitely different. However, the surface texture is unchanged. There may be fewer blocks.. Okay, bag 27 Echo. 27 Echo.

CAPCOM Copy that frame (garble).

SCHMITT Hold your bag, don't want to lose it.

CERNAN Stand by.

SCHMITT Hold it up.

CERNAN Okay, it's in there.

SCHMITT Is it in? Okay.

CERNAN Bag won't stay open.

SCHMITT It will after we get a couple of samples in there. Okay, my locator.

CERNAN And my locator. I hope I don't lose my camera.

SCHMITT I can't reach it or I would help you. Okay, 110.

CAPCOM Copy that, Jack.

END OF TAPE

CERNAN I guess I never -- I guess I didn't do what I wanted to do and that's get that thing really cinched down.

PAO We're an hour and 32 minutes into this EVA.

CERNAN -- Couple of things here, there's the Sun angle difference on that light mantle when you're looking at the slopes of the Scarp versus what we're on. I hate to use a familiar term, but my impression right here is there is more of a raindrop influence than back at the LM, we're in a darker mantle.

CAPCOM Okay. Copy that.

SCHMITT Yeah. Might be.

I think so. I think the big thing is, though, that each one of these little craters is much light -- much more lightly colored. But we're still not -- there's no crater in view that has a blocky rim. There's a fragmental rim based on, almost certainly, instant rock, but no blocky rims.

CERNAN You know, one of the reasons those craters look lighter is because of their sun angle. Walls of some of these little craters -- it's the same material we're driving on I bet. Yeah, there is instant rock right there, Jack, you're right.

SCHMITT Yeah.

CERNAN Oh boy.

SCHMITT The fragment population is certainly less than 1 percent in here. Now, when I say fragments, I'm talking about rocks that are -- are greater than a centimeter in screen size.

CERNAN You know, it might be me, Bob, but it also seems to be a little bit more difficult to drive down sun in this area.

SCHMITT Yeah, I think it is brighter Geno. I was thinking that a minute ago, but I started to make a -- I think your normal albedo is greater.

CERNAN Here's some rocks now start --

SCHMITT The little craters still have the central pits.

CAPCOM Okay, we're losing your comm a little bit, guys.

CERNAN Yeah. There's a few.

SCHMITT (garble)

CERNAN Yeah. There're a few blocks. They still -- they still look like the (garble)

SCHMITT Hard to tell.

CERNAN They're not -- a couple of them looked to me like they had some very light (garble) crystals in them. See that?

SCHMITT I'm afraid those are (garble) pits.

CERNAN They could be.

SCHMITT I got -- I think I've (garble) that, too, and that's why I estimated the(garble)

CERNAN Whoooo. I just want to keep you out of those slopes, and I'll tell you get in some -- keeping you out of them.

SCHMITT Okay, we're getting a little more blocks in here. Of course, we're approaching the dark mantle again. Now, you can see the difference. You gotta look hard for it. But, you see those craters out in there are not white anymore.

CERNAN I got to get around that slope.

SCHMITT Yep.

SCHMITT Okay, you still got the Hole in the Wall picked out over there, don't you?

CERNAN Yeah, yeah, I got it. I'm just -- And, I'm trying to keep calm with them as I'm turning here. And, I've been keeping the thing on. I don't know if they're reading it, but I've been moving it.

CAPCOM Reading you loud and clear, guys.

SCHMITT Okay. Looking up on the South Massif, we've got real good views of the block-strewn field. There's one that seems to be two dominant colorations of the rock. The light-colored ones, very light tan and too white, and then there are the blue grey rocks. There's one major outcrop of blue grey, about a sixth of the way down the slope, the center of the field of view we have, and it looks very much like similar blue grey rocks right at the crest, the highest point from our vantage point.

CAPCOM Okay, give me the range and bearing please.

CERNAN Bob, you want another sample of the dark mantle here (garble)

CAPCOM Yeah, we want (garble). As soon as you get into the dark mantle, and we're estimating it's something like 4.34, 4.5, somewhere in that vicinity.

SCHMITT We're there.

CAPCOM Okay. We're ready for --

SCHMITT We're there. Now, let's -- if you can -- okay, right over there, and maybe I can get a rock with it. See that batch of rocks there?

CERNAN Right here?

SCHMITT Whoa. Yeah. Swing it. Whoa, now swing back over. Little more, little more. Whoa. Little more.

CERNAN Can you reach it?

SCHMITT Now, you go forward.

CERNAN Can you reach it?

SCHMITT Hold it, right there.

CERNAN Okay, Bob, 082, 5.0 and 4.3.

CAPCOM Copy that.

CERNAN And CDR is 3.85 and about 70 percent, and no flareups.

CAPCOM Okay. Thank you, Geno.

SCHMITT I got it.

CERNAN You got it? Okay?
SCHMITT I got the rock. I got the rock, and there's
some dirt in there. Maybe I'd better get a little bit more dirt.
CERNAN Yeah. You don't have any trouble getting
dirt.
SCHMITT Can you see in there? Is there --
CERNAN Yeah.
SCHMITT Much soil?
CERNAN Oh, a little bit. (Garble)
SCHMITT I'll get -- I'll get this soil. Couple feet
from the hole.
CERNAN Twenty-eight ECHO, Bob.
CAPCOM Say again there, 17.
CERNAN Twenty-eight ECHO.
CAPCOM Copy that.
CERNAN And, that's primarily a rock fragment. Jack's
getting a soil fragment -- soil sample with it.
CAPCOM Copy.
CERNAN Jack, look at the wrinkles over there on the
North Massif.
SCHMITT Yeah, there's no question that there is
apparent lineations all over these Massifs in a variety of direc-
tions. Hey, look at how that Scarp goes up beside there. There's
a distinct change in texture.
CERNAN Okay.
SCHMITT As a matter of fact, lineations are not
present on the Scarp that we can see where it crosses the North
Massif. There is no sign of those lineations on it.
CERNAN Oh, man, yeah. I can see what you're talking
about now.
SCHMITT Look over by Hanover.
CERNAN It looks like the Scarp overlays the North
Massif, doesn't it?
SCHMITT Yep.
CERNAN Okay. This last one was 29 ECHO.
CAPCOM Okay. Copy that. And that's the soil..
CERNAN Okay, now I need to get in that bag. That's
(garble).
SCHMITT Here's another one.
CERNAN You're going to -- don't lose those.
SCHMITT I won't. I'll pull it down.
CERNAN Okay, Bob, we are rolling.
CAPCOM Copy that.
SCHMITT And, pray for me, Bob, that I don't lose my
camera. Okay. Hanover is very -- quite a ways up the slope.
I don't think we'd have gotten to it, as we planned that
time, but the appearance you have of the Scarp -- North Massif

contact is one of the Scarp being smoother textured, less cratered, and certainly less radiated. And, I wouldn't be a bit surprised if it's, as Gene says, younger.

CAPCOM Okay, Jack. Copy that.

SCHMITT But that goes -- it's not just the -- it's not just the slope, it's the materials on the other side of the Scarp, on the west side.

SCHMITT Okay, I'm going to have to really ease up on pictures now. I forgot to give them a frame count.

CAPCOM Yeah. You didn't give a frame count. Want to give them a frame count there, Jack?

SCHMITT (Garble) Well, Bob. The problem is everytime I take my hand off my camera loosens up again.

CAPCOM Okay, I copy that. And, our estimate is that if you kind of go between 50 and 100 meters between frames we'll make it.

SCHMITT Boy, I tell you. Are those Massifs getting to look big now. Holy Smoley. That frame at the LRV sample was about 115.

CAPCOM Copy that.

SCHMITT I'll tell you. That Scarp looks nice over there, too, doesn't it?

CERNAN Yeah.

SCHMITT Okay, we're back down in our old friend, the dark mantle, and I think the zero face point is not as bright as it was. Passing a small crater, but the block population is still way down there in ab out, woops, watch that one, one percent --

CAPCOM And, 17, for your benefit we're showing you real good net mobility rates here, and things looking quite good.

SCHMITT Thank you. Gene's doing a great job.

CERNAN I'll tell you, it takes all your time to drive, though. You look around, and you're in a hole.

SCHMITT Here's another small crater, instant rock, with the same little pits, a spattering of glass holding the pit materials together. None of these -- none of the glass linings look very coherent, Bob. They mainly just seem to be a sprinkling of glass that's -- some, halping to, or coating the instant rock.

CAPCOM Okay --

END OF TAPE

CAPCOM Okay, I copy that, Jack.
PAO We are in contact with America on the
28th revolution.
SCHMITT We still don't have - the crater's
at about 10 to 15 meters in diameter seem to have somewhat more
blocky material in their rims. But they are not clear cut blocky
rim craters and here's one that is probably 50 meters across
that has a fair number of blocks in the bottom. Looks like
it might have just about got down to where the gabbro is -
starts to be abundant again.
CAPCOM Okay, I copy on that one, Jack.
CERNAN Start. Okay at 12:00. 12:00 and I'm going
to work my way up to Hole in the Wall and from there on up.
SCHMITT Right, that's good.
CERNAN Take a long easy turn out.
SCHMITT Yep.
CERNAN Got Hole in the Wall, Bob. It is
very long, very subtle, very gentle slope. We'll just have to
get some more words when we get there.
CAPCOM Okay, we're anxiously awaiting them.
CAPCOM How about a range and bearing while you
are at it?
CERNAN (garble) most of the time.
SCHMITT Okay, do you know (garbled) 4.9
CAPCOM Copy. 4.9 on the range.
CERNAN And about 20 to 22 amps most of the time.
CAPCOM Okay, we're losing a little bit of low
gain, Geno.
CERNAN Yeah.
SCHMITT I think we need to tilt it up a little
probably under shooting the earth.
CERNAN I don't know.
SCHMITT Well, our pitch angle changes all the time.
That's our problem.
CERNAN Bob, I have been within 10 to 20 degrees
the whole time.
SCHMITT Okay, Bob, we're not in light mantle I
don't think.
CERNAN Maybe we are.
SCHMITT I guess we are.
CERNAN I think we are.
SCHMITT Find it in my geology map pocket.
CERNAN I guess we are, gosh I was going to say
the crater are white - whiter than they have been.
So we're back in it.
SCHMITT And phase points brighter too.
CERNAN I like that place where we had those
small blocky craters within the dark mantle. They're
not evident here in the lighter stuff.
SCHMITT Yep, yep.
CERNAN Boy, is that getting big. Wheeee.
CERNAN Hold on.

SCHMITT Whhhhhhoooooo.
SCHMITT Oh, boy, that really gives me a strange
feeling.
CERNAN Gives me a strange feeling too.
CERNAN They're not intentional.
SCHMITT I understand.
CERNAN I am not sure I've got enough guts to make
them intentional.
CERNAN Man, everything's getting to look big the
closer you get.
CERNAN Hole in the Wall looks more promising
though, Bob.
SCHMITT Yeah, I don't think that's your main
problem.
CERNAN Till we get up and look back.
CERNAN Oh, man, what a trip this is going to be.
SCHMITT Golly. That vent cooling is just about right
isn't it.
CERNAN No, it's just about warm for me.
SCHMITT Yeah.
CERNAN Bob, is my PLSS cooling working alright?
CAPCOM Rog. It looks like it's working to us.
CERNAN Okay.
SCHMITT Bob, I'm not - the rock fragments look
still look like gabbro, the craters tend to have white walls
and white rims which they don't have in the dark mantle area.
The block population is way down - 1 percent or less. However,
the bigger craters do have more blocks, but no where does that
population seem get above about 5 percent and that's on the walls
and the rims of the craters, say bigger than 15 meters. There's
one probably 20 meters in diameter that has some blocks on
it.
CERNAN Have you seen Nemo?
SCHMITT I think Nemo is right over there if I'm
not mistaken. It's -
CERNAN I don't know.
SCHMITT Nemo will be hard to see. But, yeah,
it's probably that one right in there.
SCHMITT Or back here. There's one back here.
SCHMITT It's pretty
CERNAN Yeah, well -
SCHMITT Yeah, that's close to Scarp. You're
probably - probably right off wing there.
CERNAN Okay, I'm going straight ahead and then
I'm going to make a low turn. We're looking at Lara.
SCHMITT Now, Lara I can see blocks in the
northwest rim of Lara. At least it's rugged terrain and
looks like blocky terrain. One spot is all I see. Look

like it may be a couple hundred meters in average diameter. It starts about maybe three-quarters of the way up the wall and goes right up to the rim.

CERNAN Hey, Bob, Hole in the Wall seems to be a -

SCHMITT Look at that - Look at that crater.

SCHMITT Right there.

CERNAN Yeah.

SCHMITT That bed, that central bed goes down about half the depth of the crater and the crater is a fresh 3 meter crater. That's - it's almost was a cylindrical pit. Hey, Bob, Hole in the Wall is just a step - headed down to the south or southeast on the Scarp. It's a scarp and just about what we all expected it to be. It is very rolling and relatively smooth. I don't really see any outcrops exposed anywhere out here to the south.

CERNAN NO

SCHMITT You see, now there's Station 3 area right up there.

CERNAN Yep.

SCHMITT Looks like maybe that - set - see that bright bigger crater over there to the right of Lara. That's probably a good place for Station 3.

SCHMITT Yeah, way over there.

CERNAN Yeah.

CERNAN Okay, we're going to find out something very shortly.

SCHMITT Doesn't look very rocky, Gene.

CERNAN No.

CAPCOME How bearing and range guys.

CERNAN Bob, I'll give it to you just as soon

as I make my turn. It's not to far - 100 meters -

SCHMITT Are you going to turn over that or go

on closer -

CERNAN I'm going right up straight ahead and

then go on inside - -

SCHMITT Yeah.

SCHMITT That's more than a hundred meters.

CERNAN Yeah. I'll - 081 and 5.6.

CAPCOM Copy that.

SCHMITT There's the - now the craters are getting very, very light colored, the rims and walls.

CERNAN You notice when we're in the light mantle looking at the scarp at this angle it loses some of its high albedo.

SCHMITT Yep. Yep. I think we're getting -

CERNAN We've got a long depression

CERNAN Your eyes get used to it. Okay, Jack
we got to watch it because I got to go around a long depression.
SCHMITT That's a crater over there.
CERNAN On the right, yeah. I don't know how
I can get over there to -
SCHMITT I think -
CERNAN I may have to go up over there. I can't
go down that hole. That one's not going to make it.
SCHMITT What's your pitch?
CERNAN Let's go back here. We can't get there.
I'll go over here.
SCHMITT What was your pitch then?
CERNAN Ah, (garbled) primarily.
CERNAN I can't go there.
SCHMITT I think you're right.
CERNAN We'll go up this gentle slope. See
what's on top.
CERNAN (garbled) up this high.
SCHMITT (GARBLED)
PAO In lunar orbit Ron Evans is right on
the flight plan.
CERNAN We made a turn to the south a little bit
at 081 and 5.7.
SCHMITT Are you going to try to drive up there?
CERNAN I don't think we have any choice.
SCHMITT Okay. Look to me like right on the -
just to the left of that -
CERNAN Yeah.
SCHMITT White crater is a - or even right like
you're headed now and then -
CERNAN Yeah.
SCHMITT Bear up to the right.
CERNAN Find out how this climbs in a minute.
SCHMITT Oh, I think you're alright. That -
CERNAN Standby, I'm starting up the scarp at
081 6.6 at 5.7.
CAPCOM Okay, copy that, Geno.
SCHMITT This is the first turn of the scarp.
CERNAN I don't think the Rover knows it's going
up hill, I've got about 37 or 8 amps.
SCHMITT See what's on tophere. You're making
about 8, 8 clicks.
CERNAN And I'm full bore.
CERNAN (laughing) I tell you this Rover doesn't
known it's going up the hill.
SCHMITT Looks to me like you may be able to head
just like you're going.
CERNAN Hey, Bob, we'll make it.

APOLLO 17 MISSION COMMENTARY 12/12/72 19:09 CST 142:16 GET 558/5

SCHMITT
CERNAN
CERNAN
SCHMITT

And get down -
Yeah. We will make it.
Get my antenna adjusted.
Okay, whatever makes up the light mantle

is in

END OF TAPE

CERNAN Whatever makes up the light mantle in -
it leaves the igneous rock it forms is much lighter than
anything we see. Those fragments probably are 30 percent
lighter than any fragments we see on the darkmantle. And
that's a round of fresh craters. But it is not blotchy.
Bob are you still reading?

CAPCOM Roger, read you loud and clear.

CERNAN Okay, I just wanted to make sure my
antenna's working.

SCHMITT We're doing a little zig zag navigation.
I'm - literally came up a slope at about a heading of 240.
We couldn't get through the actual turn to the south because
there is a big crater right at the foot of it so we're just
making our way through some relatively local undulating
slopes that get pretty steep, but there seems to be no problem.

CERNAN Bob, I can't - there are not any blocks
big enough to really make a statement about what the rock is.
But it really doesn't look like gabbro anymore.

CAPCOM Okay, copy that and a reminder that
eventually you're going to have to turn to the south a little
bit to pick up a final thing at the station two.

SCHMITT We're not on top of that scarp yet. We're
still in the Hole-in-the-Wall rim.

CAPCOM Okay, copy that.

SCHMITT Bob, as far as lineations in the soil or
on the surface that are observable at this range. I don't -
I don't see any. I think there maybe a finer raindrop pattern
on the light mantle then maybe there was out on the dark.
But, that's an awfully hard judgement to make.

CAPCOM Okay, copy that. How you doing, Geneo?

CERNAN Doing fine Bob we slowed down between
about 5 to 8 maybe 5 to 10 clicks most of the time. I'm
going to head right up there I think, get around this crater.

CERNAN Pretty healthy roll you're going to have
here.

SCHMITT Yes, I'm going to head more straight up
the hill - once I get up on top I'll be alright. I'm going
to head down in this hole and then up that way.

CERNAN Yes, I think.

SCHMITT I don't mind pitch, but I sure don't
like rolls.

CERNAN I don't either.

SCHMITT Now I'm going to head straight up that
slope right there. Okay.

PAO Ron Evans performing infrared, ultraviolet,
laser altimeter experiments.

APOLLO 17 MISSION COMMENTARY 12/12/72 CST 19:19 GET 142:26 559/2

SCHMITT It looks like maybe the large fragments
in here are still crystal and they have white zap pits on
them. But, they do not yet really resemble a gabbros.

CAPCOM Okay, Jack, copy that. Give us a hack
when you get up on top of the scarp there.

SCHMITT Okay, let me tell you Bob I've got to
go cross slope some of the time because the rover is really
to go up hill now.

END OF TAPE

CAPCOM Okay.
CERNAN Let me tell you, Bob, I've got to go across slope some of the time because the Rover's really working to go uphill now.
CAPCOM Alright.
CERNAN But, we're almost there.
SCHMITT As I look up at the scarp to the west, there are some big blocks scattered around on our horizon, but again, I would guess that we're not dealing with more than two or three percent total coverage of blocks in here at that.
CERNAN Well, I think for the most part - for the most part, we're on top.
SCHMITT Yeah, we're on top.
CERNAN Bob, we're at 7.8 - correction 0787.2 and 6.2.
CAPCOM Copy that.
CERNAN Jack, where was Nansen with respect to those tracks up there?
SCHMITT Well, they never really had any good tracks pinned down, I don't think on that - you'll be able to see Nansen soon as you get over this hill.
CERNAN Boy, I tell you, when we look back, that's going to be quite a sight if we can see into that Sun. We have been coming uphill.
CERNAN Well, I'd say this is the last straw to the top and is she working. Come on, baby.
SCHMITT Okay, I think you bear -
CERNAN I'm going to try to get over along the base of the massif.
SCHMITT Yeah. Head toward that track area anyway.
CERNAN There are a lot of boulder tracks coming down from the blue-gray rocks, Bob.
CERNAN We'll see whether or not we're going to get to those tracks at Nansen or we might want to move over to the track and see if we can find the boulder that made them.
CAPCOM Okay, if they're in the vicinity, it might be a nice idea -
CERNAN But there's no question where those tracks come from.
CAPCOM And we gather you're slowing down to about 5 clicks now coming up this last rise.
CERNAN Yeah, I'm back up to about 7 to 10 now, Bob. That's the slowdown is because that's about all it will take.
SCHMITT Bob, I have the impression that there is a dipping zone of blue-gray outcrops or block concentrations up there on the massif that trend from the high point just beneath the earth cross slope and probably is at least the apparent depth is, oh, I don't know, 10 or 15 degrees to the east. It looks like those outcrops may match up along that trend.
CAPCOM Okay.

CERNAN Jack, I'm going to head right along this ridge because I think that'll be the depression we were talking about.

SCHMITT That's Nansen down there.

CERNAN Right - Where are you looking?

SCHMITT Right below -

CERNAN I think you're right. I think that's it. Let me get over here and I'll head a little bit to the south.

SCHMITT Yeah, we're a little more west, I think than we intended to be.

CERNAN I think you're right.

SCHMITT Bob, 7 - wait a minute - 7.8 and 6.5. Bob, I've had an impression and I can't prove it yet, that we're dealing with a more heterogeneous rock, possibly there are breccias in here. But it's awfully hard to tell right now. There are very bright colored rocks, I think even lighter colored than the gabbros.

CAPCOM Okay, we'll soon find out.

SCHMITT I'm afraid those - I think we can follow those tracks - the pictures, maybe.

CERNAN Yeah, I think we can see some of those coming down.

SCHMITT I think the ones from the big outcrop of blue-gray rock though, are the ones going into Nansen.

CERNAN Bob, my best guess let me see - 0777.7, 6.7, is that we're coming up on the northern side of Nansen.

CAPCOM Okay, we copy that, Gene-o.

CERNAN And let me tell you, this is quite a Rover ride.

CAPCOM It sure sounds like it.

CERNAN That is quite a machine, I tell you. I think it would do a lot more than we'd let it.

SCHMITT That's right. I think that big crater up there on the side is the one you can see in the photograph just above station 2.

CERNAN Yeah, I think if I come up here and do a hard left turn, you unbuckle your belt, you'll roll right down in to the bottom of Nansen.

SCHMITT I'm afraid you're right.

CAPCOM Okay, remember we're going to about 068 and 7.4 station 2. At least, that's our estimate.

CERNAN Bob - Bob - okay, there's Nansen over there, uh, huh.

SCHMITT Yeah, I think so.

CERNAN Yep. I think you're right. It's got to be it. Got to be it.

SCHMITT Yeah, Bob, I think we're into our breccia population now. I think the blocks in the light mantle are largely breccia. They're mottled in their characteristics. Their white zaps do not seem to be nearly as burned and tend to be chalky when they get hit. At least, in the large craters, the walls are chalky looking. Oh, yeah, we've got boulders in station 2.

SCHMITT Yep, they're there.
CERNAN Yes sir.
SCHMITT Boy, I tell you, if I hang on to this camera until you stop and can tighten it up, it'll be a miracle.
CERNAN Bob, how long have we been driving?
CAPCOM Stand by. We estimate you've got about a kilometer and a half to go - a little over a kilometer, anyway. Stand by, we'll check on the time. You're doing great.
CERNAN How long in the -
PAO We're 2 hours into the EVA.
CERNAN Man, this has been a trip. Man, I tell you. We're really up on top of this thing.
CAPCOM You guys have been driving 64 minutes and that counts the time to stop and deploy the charge and pick up the Rover samples.
CERNAN Hey, Bob, we're very clearly going downhill now, into the trough area that - that surrounds the massif, or between the mantle and the massif, but the trough is much greater in extent than just Nansen scale. It's probably a kilometer wide. I never realized that it was so much of a depression in here.
CAPCOM Okay, how about a range readout.
SCHMITT I'm not sure we're going to be able to see the LM.
CERNAN 0748.26.9.
SCHMITT We won't be able to see the LM from down here. We'll be too low to see it. Fact is, I don't think I can see that far. The surface patterns are still the same, Bob. Their main difference being that we're getting and there's probably a gradual increase in block population and the blocks seem to be of a different character. They may be breccias.
CAPCOM Okay, copy that.
SCHMITT And around the crater here, it's maybe 75 meters in diameter. The - there's probably 5 percent blocks - fragments, I should say - greater than a centimeter.
CERNAN Boy, look at all the dust around that fender. I hate to think of what it would have been like with that fender gone.
SCHMITT There's a good sized rock, sorta blue-gray.
CERNAN Looking up there, Jack. I ought to get the 500 looking right up that hill, but -
SCHMITT Well, you may want to do that way out away, aways.
CERNAN Did - some of that stuff is mantled - or buried in the massif material.
SCHMITT Some of it just seems to be laying on it.
CERNAN Yeah, well, I think it has to do with how long it's been there. You'll tend to get the downslope movements forming uphill fillets and that's what a lot of it looks like.

SCHMITT Most of it is uphill fillets. Most of it is pretty sharp.

CERNAN But, my guess, from back at the LM, that those blocks on the massif were much more angular - I think it's a good guess, because that's what they look like to me here. And looking up into our blue-gray outcrop area, I still have even more the impression that there's a - a plainer orientation that dips off to the southeast - maybe just fractory, but I - pretty clear up there, I think. It may - it may be shadows. The LM is now 50 percent away from the massif - let's see, 50 percent of the massif height away from the massif. How's that? I think we will keep that on to - that is a high mountain. Gemine Christmas.

SCHMITT Listen, if the Earth goes behind it, we're changing station 2.

SCHMITT It'll be nip and tuck, pardon the expression.

SCHMITT Okay, as we get closer, actually, we're out of the very - the block area, and in that blocky region, that 5 percent may have been associated with that crater.

END OF TAPE

SCHMITT I still see no lineations, although --
CERNAN Look at these wrinkles, though, Jack --
SCHMITT I mean on -- I was talking about the mantle.
But, you're right about on the Massif.
CERNAN The same wrinkled lineations we saw streaming --
sloping uphill to the west on the eastern half of the Massif are
still very evident at this Sun angle.
CAPCOM Okay 17, and we're estimating that you should
be there within --
SCHMITT Come back up.
CAPCOM --- about 5 minutes to meet the walkback
constraints.
CERNAN Well we're -- Bob, we're almost ready to
park.
CAPCOM Okay. Beautiful.
SCHMITT Well, I wouldn't have gone so far as to have
said that.
CERNAN Well, we're getting close. I'll give them
their five minutes. We'll make it by then.
SCHMITT Bob, the boulder tracks are really just chains
of small craters, for the most part.
CAPCOM Okay. Copy that. That's interesting.
SCHMITT I hope that they can tilt that television.
CERNAN I don't think they can tilt the television
camera high enough to see the top of the Massif. Jack, we're
on the edge here, but I don't know -- is that that (garble).
SCHMITT No, you're doing great. (Garble)
CERNAN 718.9 and 7.4.
SCHMITT See, there's Lancelot to Nansen off to my
right now.
CERNAN Yeah, I just wanted to make sure that I'm
not driving down a hole here, which I am, but -- Don't want to
drive down Nansen.
SCHMITT No, I -- you won't. The saddle -- the end
of Nansen is over there near those blocks. Right over there.
Look at those blocks. Unfortunately, the boulder tracks -- good
boulder tracks are over into Nansen.
CERNAN Going out of here very slowly.
SCHMITT I think Station -- just about anywhere near
the big blocks --
CERNAN Yep, good place for Station 2.
SCHMITT That's where I'm going to put it. We could
try to -- let's see. Yep, that's where we're going to make
Station 2, right up there.
CERNAN Where? Straight ahead?
SCHMITT Yep.
CERNAN Yeah. Okay.
SCHMITT Boy, you're looking right into Nansen.

CERNAN Yep.
SCHMITT We're right where we wanted to be for
Station 2. And, it looks like a great place. Big blocks. It looks
like quite a bit of variety from here. Different colors, anyway.
Grays, and lighter colored tans.
CERNAN Hey, Jack, I'm going to do a 180, park the
Rover at 045.
SCHMITT Those are two good -- there's a blue grey
rock and a lighter colored tan rock.
CERNAN See where they can look in here.
PAO We'll have television shortly after they've
parked. Station 2 is right at the face of the South Massif.
CERNAN Garble
CERNAN 9.1 7.6. Are you reading, by the way?
CAPCOM Roger, reading you loud and clear.
CERNAN Okay. Let me get undone here. Amp hours
are 98, 98. Batteries are 90 and 112, and the motor forward
left is off scale lower and right is 340. Forward rear is off
scale lower and right is 240. I expect we've got a bad meter.
CAPCOM Okay, copy that on the 340, and you want to
give me the bearing one more time there, Gene. All I got was
the distance at 9.1 and the heading - range.
CERNAN Yes sir. 0.1, 9.1, 7.6. We are right at
Station 2. Look at Nansen.
CAPCOM Okay, we copy that. When you're at the
Station, here's a couple of things --
CERNAN Five minutes --
CAPCOM -- we'd like for you guys to look at in the
overhead and in addition to them we'd like the TV lens to be
dusted in addition to the regular dusting. That'll take the
lens brush, remember.
CERNAN Did you try to tighten that?
CAPCOM You might check the low gain antenna eleva-
tion to make sure it's at 45 degrees. We'd like -- we think
you commented on that, and I think you're right now looking at
tightening Jack's camera handle.
SCHMITT I'll work on that, Gene. You go ahead with
the other --
CERNAN Okay. Yeah, we are at 45 degrees, Bob. Let
me check it. I'll lose the comm on you a second. I've got to
turn it towards me.
CERNAN Mark it 045.
CAPCOM And, 17, Jack, we'd like you to take the
set for us. I suspect we'll have to turn it off and open the
mirrors and dust them.
SCHMITT Boy, when you get this picture --
PAO TV coming in now.

CERNAN You got high gain.
CAPCOM Roger. Thank you. We got it on the TV.
CAPCOM Geno, we do not get good bearings from you
guys.
SCHMITT Oh, Manischewitz.
CAPCOM We might also check the LMP's camera.
CERNAN Okay, I'll give it to you again.
CAPCOM That's fixed.
SCHMITT Oh, you mean for pictures?
CAPCOM Roger, (garble).
CERNAN 071, 071 is the bearing.
CAPCOM Okay, copy that.
CERNAN 142, 142 on the LMP's camera. The temperature
is 105.
CAPCOM Roger. Let's turn off the power and the
recorder, open the blankets and dust it.
SCHMITT Power's off, blankets are open, and, Gene,
you'll have to dust it.
CERNAN I'll get it. I've got a lot of dusting to
do here, Jack.
SCHMITT Okay, let's see what we've got to do.
CAPCOM And, Jack, I presume that you turned off
the receiver, didn't you? Not just the DSDA?
SCHMITT That's affirm. I turned off both switches.
CAPCOM That's what I thought. Thank you.
SCHMITT Oh, my scoop. My scoop just came off.
CERNAN That's interesting. I'd better check the
rake. Vibrated loose, I guess.

END OF TAPE

CERNAN I'll get the battery covers.
CAPCOM Okay, and Jack, and we'd like to get an
EMU check on you.
SCHMITT Stand by.
CAPCOM And Jack, we'd like to go to India on the
magazine for you.
PAO Gene Cernan in the foreground.
SCHMITT Okay, magazine India. My goodness, we'll
never get started.
CERNAN Man, we are down in a - look at where we
came down, Jack.
PAO Jack Schmitt in the picture, now.
CERNAN And that was just one of the hills. Got
to go back up and then down some.
SCHMITT Hey, thank you for that fix on the fender
by the way, cause I'd hate to see what it would look like
without it.
CAPCOM Okay, and John suggests that we might just
check it momentarily while you're here to make sure its still
holding on good and tight. (garbled) clamps and the tape.
SCHMITT Yeah, that's on my list. If it stayed on
through that ride it may never come off. Okay -
CERNAN Have you got a brush in there, Jack?
SCHMITT Yeah - Well, hold it a minute. I've got to get
this step. Do you want me to brush this step, is that what
you said?
CERNAN Yep - Do you want the covers open?
SCHMITT They should be open and dusted.
CERNAN Okay, the step is open - its about 100 de-
grees.
SCHMITT 105 - or it won't work.
CERNAN 105? Okay. And its dusted.
SCHMITT Here is a lint brush if you need it.
CERNAN Okay, thank you. Does that camera look
all right to you? Let me get yours, lean over here and
I'll get yours. Okay, I'll get mine too.
CAPCOM And, Jack, we're suggesting that you're
getting a little warm - maybe intermediate might help.
SCHMITT Bob, I feel the same way but I want to
get this camera fixed.
CAPCOM Okay.
SCHMITT I mean, the film changed.
CAPCOM Okay.

CERNAN Can I change your (garbled)

CAPCOM Oh, thank you, Geno. It looks much better.

CERNAN How about - Any other service I can be?

SCHMITT Okay, okay, Houston. The number of blocks plotted on the map are not nearly enough. In the greater than one meter range there are many other blocks on the flank - on the massif flank of Nansen and up around station 2 where we are. There are only 1 or 2 blocks on the light mantle side of Nansen. It looks as if the material in the bottom of Nansen is overlighting the light mantle materials of the north wall. That's just an impression. There's slightly lighter albedo than the north wall of Nansen.

CAPCOM Okay, copy that, Jack. Looks so fantastic up there.

SCHMITT And I suggest that we - I suggest that we do our raking - that's right I just told you everything you could see - fairly close to the Rover to get the front of the general population of talus material coming off the massif.

CERNAN Bob, (garbled) I've got everything - hammer, gnomon film - Okay. Mark if you have a gravimeter measurement going.

CAPCOM Roger, copy the mark.

SCHMITT Okay, Bob. The blue-grey rocks are breccias. They're multi-lithic, grey matrix - matrix breccias I guess. There are fragments in them, but it doesn't look like more than about 10 or 15 percent fragments. Some of the light - the light colored fragments seem to have fine-grained - very fine grained - dark haloes around them. That bit do not have white haloes so I suspect they are not crystalline. They might be glass - they might be the the micritic or glassy breccias. At least the one big rock we have here.

CAPCOM Copy that.

SCHMIDT There's a rough, very rough, foliation in them - that - and I'm not sure its shown by the elongated knobs on the surface. It looks like a fracture foliation of some kind.

CERNAN Jack, that rock has almost got to have come down, don't you think?

SCHMITT Oh, no question about it. I -

CERNAN I'll bet you - I'll bet you that its the same as the blue-grey rocks we see up higher. Here's some more blue-grey ones over here.

SCHMITT Let's - let's start taking -

CERNAN Oh, yeah. Look at the size of some of these light (garbled) ones in here.

SCHMITT Yeah, but it still - I don't - it looks like they're dominantly matrix breccias. There - there are light coloured fragments and they may be crystalline - they are - they're very light colored - they look the shattered anorthosites, they have white haloes - I think that's what those fragments are.

CERNAN Jack, let's get a piece of this one right here.

SCHMITT Okay.- biggest one here.

CERNAN Get 'er up.

SCHMITT This is the blue gray variety, Houston.

CAPCOM Okay, copy on that.

SCHMITT I want to take that little knob off up there.

CERNAN Okay, well, you can sample - you can work that block over - we can get several examples.

SCHMITT We ought to sample across that layering actually, that foliation.

SCHMITT One comment - when you look down into the bottom of Nassen it looks like - like I guess what sure is obvious - that some of the debris there has rolled off of the South Massif and covered up the original material there which covers the north wall of Nansen. There is a distinct difference - you've got that very regal texture in the north slopes of Nansen and then you've got the South Massif debris in the south slopes of Nansen and the debris of course overlays the north slope and all the rough fragments, all the boulders that have come down are all on the west side of the - of the - correction, on the south side of the slope of Nansen.

CAPCOM All right -

SCHMITT Okay, Houston, I take back what I said about no haloes. There are light - not very sharply light - but light haloes around that that's in the matrix. The matrix glass is dark and it seems to have a greenish cast but its very dark.

CERNAN Oh, look at that blue. Look at the white fragments in there.

SCHMITT Let me come and help you there.

CERNAN Man, there's a bowl of rolling rocks here, Jack. (laughter)

SCHMITT Okay, don't wreck the fillet - - There's an overhang we've got to get into.

APOLLO 17 MISSION COMMENTARY 12/12/72 19:41CST 142:48GET MC-562/4

CERNAN Okay, 514 is the - Okay, I'll take it
back on the fresh surface. These look like fragment breccias.

END OF TAPE

SCHMITT Take it back on the fresh surface - these look like fragment breccias. Although the fragment size is very small. There are dark gray fragments and the light fragments we talked about. The gray ones are very fine grain and dense; although I see flashes that indicate they may be crystalline. The light colored fragments are as I described them earlier, I think.

CAPCOM Copy that.

SCHMITT 514.

CAPCOM Okay, Jack, if you could tear yourself away in the middle of that sometime you - to give us an EMU readout, we'd appreciate it. We haven't gotten that from you yet on the EVA.

SCHMITT Okay, I'm standby, Gene's - got a rock to throw. That's from up higher -

CERNAN That's a little higher. See that shelf up there.

SCHMITT Okay, the first rock was from about a 514 was from a meter above the base of the rocks - 5 15 from about a meter and a half.

CERNAN Here, can I get this in your -

SCHMITT Can you get some on either side of those two now?

CERNAN Yup.

CERNAN Okay, you're open, I'll leave you open for a minute.

SCHMITT Okay.

CERNAN Just so they don't fall out.

SCHMITT Am I in?

CERNAN No. Let me get this open, okay.

CERNAN Okay, go ahead.

CERNAN Have to try from back here.

CERNAN Of course, that's a northsouth over hang.

SCHMITT Yeah.

SCHMITT That one.

SCHMITT Yeah, you're facing right into the east end.

CERNAN Yup, yup.

CERNAN I don't know. If I can get a piece back here or not.

SCHMITT How about right where your (garble) is - yeah.

CERNAN Right here? I can get that.

SCHMITT Yeah, that's good.

CERNAN Ohhh beautiful. It's a gnomon.

CERNAN Well, it didn't move. It just tilted it.

SCHMITT This it?

CERNAN Yeah, that's it right there.

CERNAN Let me set my working tool down here.

SCHMITT Got a bag.

CERNAN Coming right up.

SCHMITT Boy, that dust, once you get it one you get it on there you might as well forget it.

SCHMITT 494. 494 is from a half a meter above the base of the rock.

CAPCOM Understand 0.5 meters up.

SCHMITT And these are samples across the layering. These are samples from across the - Foliation. I missed that Bob.

CAPCOM Okay, copy that now.

SCHMITT What do you think?

SCHMITT Can you get that - can you get that one up there.

CERNAN Yeah. I might either get that or this other piece up here. Without busting my butt

SCHMITT Well, don't take any chances.

CERNAN I'm not going to.

SCHMITT How about this one?

CERNAN Here's a whole big piece. Okay.

SCHMITT That's a good representative fragment.

Can you get it?

SCHMITT I can't reach you without my camera hitting.

SCHMITT That's a football size fragment.

SCHMITT Okay, this next sample - Can you get a bag out and we'll try to put it around it.

SCHMITT Around the end.

SCHMITT Bob, it's highly variable. This is a light matrix breccia whereas the other three fragments were dark matrix or dark fragment breccias. The big rock is a light matrix breccia with dark fragments and it's the one that has the halos around the light fragment and that's in 495, barely. It's not even in it. It's just 495 is wrapped around it.

CERNAN It's not going to stay.

SCHMITT It's not going to stay, is it?

CERNAN Nope.

SCHMITT It's a football size fragmental rock.

CERNAN Let me -

SCHMITT Why don't you just dump it. See if you can dump it in there with that - with the bag down -

SCHMITT Yeah, it'll - we'll be able to identify it 495 when we get back.

CERNAN Okay, it'll stay.

SCHMITT Is the bag on it good.

CERNAN Yeah, I'm trying to tape it down.

CAPCOM Okay, we copy that Gene, and you guys keeping tracks coming down to these boulders, Can you - do you have any feeling if you can place these that way?

SCHMITT Bob, unfortunately no, the main tracks are out in the Nansen and we, I don't think we can get over there.

CAPCOM Okay, that's those biggies that we seen on the left, huh?

SCHMITT But the visual (garble) - yeah, coming up I was looking and there are no obvious tracks coming down

down here.

CERNAN Watch your shadow, Jack.

SCHMITT Yeah, I'll get it. Wait a minute, that gnomon is probably not - well, that's right, you got stereo earlier.

CERNAN Yeah, I reset it.

SCHMITT The gnomon was moved a little between the samples.

CAPCOM Okay, we copy that.

SCHMITT Did you pick a vertical band?

CERNAN Yeah, I'm cutting it off. I'm getting it off.

SCHMITT You getting a flight line? I'll get a flight line this way.

SCHMITT Post sample, flight line.

CERNAN Okay, Bob, I'm frame count 42.

CAPCOM Copy, 42.

CERNAN Did you get a locator from here, Jack?

SCHMITT Yeah, okay.

SCHMITT Okay, I got a flight line on the North south trend, Gene got east-west.

SCHMITT You gonna get that sample under there?

CERNAN Yeah, we got to get the soil.

SCHMITT There might be an overhang. Look at that - that rock is fragmented, let's see, but it's east, it's southeast, northwest, there's a split.

CERNAN Yeah, that one right over there is okay. You want to get - hey did you want to get this?

SCHMITT Yeah, I'll get that.

CERNAN This fillet, you got it?

CERNAN This is a fillet from underneath the rock.

CAPCOM Roger, and an update on the rake samples when you get around to it, we'd like to get one up on the Massif slope as much as you can. If you can get over to it. And then the second one down near the Rover.

SCHMITT Okay. Okay, Bob, this fillet is up underneath an overhang. I got it from about - -

CERNAN I got to get uphill from you.

SCHMITT It's about -

CERNAN That's good.

SCHMITT Oh, ah, a third of a meter under an overhang. And it's the upper three centimeters of soil.

CERNAN And it's bag 496.

SCHMITT Now let me get one out away from the overhang a little bit.

CERNAN Okay.

CAPCOM Okay, you think that's permanent shadow?

CERNAN A way away from - no, no it's facing east.

CAPCOM Okay.

SCHMITT Okay, and a sample down to a depth of about 5 centimeters, about two thirds of a meter from the boulder, the south side, is in 497.

CAPCOM Copy that.

SCHMITT Now let me get a skin sample, Geno.

CERNAN Okay.

CERNAN I got to take a set of pictures after that, by the way. Show where they are.

SCHMITT I can feed them into my (garble) stereo.

CERNAN Okay, they were in both of the before pictures on those rocks.

SCHMITT Okay, about a centimeter deep skin.

CERNAN Careful. You're in a hole, you better come out.

SCHMITT Yeah. Boy, that's hard on your hand even in 1/6-g. Okay, and that was -

CERNAN Okay. I didn't part that Rover in a very good spot for them to watch what's going on, I guess but that was the heading.

SCHMITT Oh shoot, they're missing all of it.

CERNAN We didn't work in the right spot that's all.

CAPCOM Every now and then we get a peek at you guys, but only every now and then.

CERNAN Sorry Bob. Oh, wait a minute.

SCHMITT That's the way it happens.

CAPCOM (garble) sample bag number please.

CERNAN Okay, it's back on.

SCHMITT Okay, Bob, I missed that, I didn't give it to you, but I think, the next bag I take out - you can check the num - well, wait a minute, I'll do it for you.

CAPCOM No, that's okay, I suspect it's 498.

SCHMITT I'm almost positive it was 498.

CAPCOM Okay, we'll put that down.

SCHMITT Yeah, I did too.

SCHMITT Okay, Bob, looking at the rock, directly down Sun, there are - the light gray matrix breccias, seem to be fragments or (garble) anyway within the white matrix breccias.

CAPCOM Okay, I copy that.

SCHMITT And I got a couple pictures down Sun to show that texture.

CAPCOM Okay, and one thing we'd like to do would be to sample a variety of blocks in terms of looking at differences in the blocks. From block to block.

END OF TAPE

CERNAN Rog, we're going to do that. we're going after a gray - I mean a lighter colored block, now. Are you going up there?

SHMITT Yes.

CAPCOM Okay, and if you're going up the massif why don't we try and get the rake sample up there now when you finish these rocks.

CERNAN Hey, Jack don't come up here unless you bring the rake. It's a long trip. No since coming up here twice. I can go get this sample. I'd get the rake if I were you - don't walk back up twice.

SCHMITT Well, I'm not sure there is any gain in anything by coming up to the top.

CERNAN Okay.

SCHMITT You're not going to gain a thing, Bob -

CAPCOM Stand by.

SCHMITT - you're still on the talus, you guys.

CERNAN Oh well.

SCHMITT The rims of the small craters in the talus are softer than the normal terrain. My foot goes in - maybe 10 centimeters where it normally only goes in a centimeter.

CAPCOM Okay, as long (garble) we don't have to get very far up the slope.

SCHMITT That's right.

CAPCOM And Jack if you're back at the rover how about giving us a grav reading when you - before you leave.

SCHMITT Because I'm late sampling that's why, but I'll do it anyway.

CAPCOM Roger.

SCHMITT Okay 670 155 201 670 155 201.

CAPCOM Okay copy that, Jack. Press on.

CERNAN Okay, Bob I'm in another boulder up the slope here it's - looks quite similar to the one we just sampled except there is a lot of flake fractures on it. Non-uniform, nondirectional, but quite - quite different at least on that other rock in terms of the fracture pattern. The texture looks to be quite similar. Boy, I'm glad I don't have to walk to the top of this thing.

SCHMITT Hey, look Gene on these rack samples. There is just no point in carrying a rack all the way up here.

CAPCOM Negative, Jack as long as you're above the break -

SCHMITT All we needed was a break in the slope.

CAPCOM As long as your above the break in the slope that's right.

SCHMITT Well, that's all right it's being done, but let's watch those kind of calls please.

CERNAN They can't appreciate the toughness of going up this slope, though. We can - we've got to tell them that.

SCHMITT Well, we did.

CAPCOM Yes, that's what we were saying don't go above just at the base of the break in the slope, Jack. Don't climb all the way up there with it.

SCHMITT Oh, relax. Okay, we're all set, Bob no problem. We can.

CERNAN We want to get away from that big rock, because it's probably shedding.

SCHMITT Hey, that's a different rock, Gene.

CERNAN Yes, well it looks like the same texture, but it's got that flaky fracture pattern all over it. I'm going to get a stereo while I'm at it. Yes. This ought to cover any samples I take off of that thing. I'm going to get myself a zap of cold water.

SCHMITT Man, we've got to be a million miles away from the LM.

CERNAN Okay, this is a crystalline rock, Houston. It's got nice white halos around the zap pits. The zap is - the zaps are not dense black black but a dark greenish, very dark greenish grey.

SCHMITT Are those halos or fragments?

CERNAN No, they are halos, well, they are fragments, I think, also. But right now it's fairly crystalline but it is heterogenous matter of fact, there's a big fragment of porphyry caught up in this thing I think.

SCHMITT Do you have a locator, by chance. I haven't got a thing.

CERNAN Okay, well I want to start taking some -

SCHMITT Yeah, we gotta get some of that.

CERNAN That's what I want, that's where I'm going right now. And there's a chunk there we can get.

SCHMITT That's a big fragment within this crystalline rock.

CERNAN Take a picture of that.

SCHMITT Inclusion.

CERNAN Take a picture of that and then when you locate 'er I'll get it.

SCHMITT Go ahead, I've got it.

SCHMITT Got it?

CERNAN Yeah, I've got it. Beautiful.

CERNAN Looks like a porphyry. (garble)

SCHMITT It looks like an after site porphyry that's what it looks like. The border has got the very large crystals in there. They're very - they're very reflective elongated crystals.

SCHMITT It's a relatively angular inclusion about, it's about a half a meter in size and it's a square cross section. Well, it's irregular, but generally square a cross section. It's in bag 516 and it looks like a, well it's a high belt bar rock. It may be anorthositic gabbro but it is, it does look like a porphyry.

CERNAN There's a big chunk where I got - I can't get it out though, it's buried in a rock, a very, oh half an inch, elongated, I can't see whether they are colorless or not, but they are certainly reflective crystals.

CERNAN See that up here - see right there.

SCHMITT Yeah. And in the big rock you've got massive things like this big, this big fragment here that's 5 inches across.

SCHMITT Well, that maybe a small point, Gene, that's a lighter a color in general because of a zap or something.

CERNAN Let's get the - let me get some more samples of it.

SCHMITT We need to get some of the host rock here.

CERNAN Okay. We'll get a piece here.

SCHMITT Okay, now, you're still sampling the - one we just got.

CERNAN Going to get another one.

CERNAN Okay, the same kind, or the contrast of that rock looks very much, looks like it might be finer grain, but it's about the same in 517. That's the contact in the inclusion side of the contact, of the contact.

SCHMITT Keep going after the other one, Gene, I'll get this thing there. They're bagged.

CERNAN Bob, you could probably see this rock if you look over this way, we're high enough.

CAPCOM Yeah, we saw it, Geno, quite a sight - quite a goodie.

CERNAN Okay.

CERNAN Let me see if I can't get this one here. There it is. Okay, the host rock for the inclusion which appears also to be crystalline, but may be a recrystallized rock of some kind -

SCHMITT Can't see it to well.

CERNAN - metaphoric, also looks like a high plagioclase anyway, that's in bag 518 and that was a loose frag, fairly loose but in place, fragments along the fracture zone.

CAPCOM Okay, uh -

SCHMITT Just a minute, I'm going to try to get the rest of it up there.

CAPCOM Okay, 17, and for your thinking, in a few minutes you might, also the back room raises about taking 10 minutes out station 4 and adding it into this station, giving the wealth of interest that seems to be occurring here. You might think about that. You never have been to station 4 and it's to hard to judge but if you think 10 minutes could be a very profitable spent you might as well do that.

SCHMITT Okay, Bob, we'll think about it. This is a medium green anorthotitic gabbro and it looks like it has some pastel green alpine crystals in it. Did you get it.

CAPCOM We copy that.

CERNAN I can't get any more of it, Jack, up there, I can't reach any more.

SCHMITT Okay, and that small chip of that is 519, it's the same host rock, much like the previous sample.

CERNAN There's a good sample for you.

SCHMITT Okay, and another chunk of the host -

CERNAN Oops, be careful, it's still there.

SCHMITT Yeah, I've got it.

CERNAN I need to get rid of this - Okay, it's in there. I haven't closed your bag yet, and we've got to one soil sample up for show here.

SCHMITT Oh, we didn't get the rake, we ought to get a soil sample, though, up here, it's -

CERNAN We'll get the rake sample right over here on this slope. Where does this thing go, Jack.

SCHMITT Right here.

CAPCOM Okay, was that last sample in 518 as well.

SCHMITT there it is. That's it right there.

CERNAN No, we haven't put it in yet.

END OF TAPE

SCHMITT No, we haven't put it in yet.
CAPCOM Okay.
SCHMITT Bob, that will go in 499.
CAPCOM Copy that.
SCHMITT You get it?
SCHMITT Okay. Bob this is a very uniform looking rock.
It does have some widely spaced fractures across it. Clearly
crystalline, it has crystalline inclusions in it.
CERNAN Hey, Jack - -
CAPCOM Copy that.
CERNAN Might get the soil from around (garbled).
Both rocks looks like they might be in the anorthositic class -
SCHMITT Your bag is still open part way too.
CERNAN Of rocks. It's just that it - one is - has
appears to be poorer finer grain matrix. Looks like a porphyry
in the boulder.
CAPCOM Okay, and a reminder as you photograph it,
remember that photograph in the southwest quadrant there will be
best ones around the corner on two sides there will be the best
one to show the structure through the whole rock.
SCHMITT Yes sir. On the southwest - south and west.
CAPCOM Roger.
SCHMITT South and west.
CAPCOM Roger.
SCHMITT Now west's in shade. You mean the -
CAPCOM Southwest -
SCHMITT South and east.
CAPCOM Roger the southwest base or pace is not quite south.
CERNAN Okay, I got a stereo - I'll just continue my
stereo around here. Hey Jack, you can get way under there - I
know you can get soil, I don't know how long it's been shadowed
but its been shadowed as long as this rocks been here.
SCHMITT Okay, I'll do that.
CERNAN Way out under there. I've got to stereo this
one. I've already got it.
SCHMITT Well I'm getting it from this way and they
like that. Did we kick any dirt under there?
CERNAN No. I don't know - don't think so. Go way
down in there. Let me get a couple of after pictures. Now we
want to get 2 sides of these rocks and you can see their structure.
SCHMITT I've got that, Gene.
CERNAN Okay.
SCHMITT I took those. I took that stereo.
CAPCOM Okay, I'd like to remind you guys to get a
pan from there before you leave the high uphill area here. There's
no point in climbing up there twice remember.
CERNAN Yes sir, Bob. How much time we got here now?
CAPCOM Stand by.
SCHMITT Okay, you got your bag?

CAPCOM Okay, we got 12 or 13 minutes left at this station unless you take that extra 10 minutes that we were offering you.

CERNAN Let's take it, Bob. We got to get the rake. Let's take it - we'll -

SCHMITT Okay. Let me try again.

CERNAN Okay.

PAO That's the Earth in the picture.

SCHMITT (Garbled).

SCHMITT Yeah, I got in a - I got under a east-west overhang about 20 centimeters - way back - by the way then I - it goes even farther but that's about as far as I can reach back there now.

CERNAN (Garbled) here's an object.

CAPCOM Okay, I copy that.

CERNAN That's in bag 500.

CAPCOM And 17, if you want to take a minute, you might look up in the sky and notice our camera is taking a beautiful picture of Mother Earth.

CERNAN Isn't that pretty over - can you see the Massif too?

CAPCOM Now we're coming down to look at the Massif. Isn't that a beautiful picture, of the Pacific, Ed finally found it. Now we see the Massif.

CERNAN Okay, and Bob I took an after picture of where Jack just got that soil sample under the rock from and I'm on 60.

CAPCOM Copy that.

SCHMITT Is that a gnomon?

CERNAN Yeah.

SCHMITT I'll set it up for the rake.

CERNAN Okay, I'll go up there and get a pan, Jack.

SCHMITT Okay. You get that pan -

CAPCOM I - didn't get that soil bag number, Gene - Jack.

CERNAN We didn't hear. 500.

CAPCOM Copy that.

PAO We're 2 hours and 46 minutes into this EVA.

SCHMITT We're on a pretty good slope, Geno.

CERNAN You bet you. And do I know it. Hey, Bob how long have we been at this station?

CAPCOM Stand by. You've been here about 40 minutes right now. Can you believe it?

CERNAN No, I - Jack - already - Jack?

CAPCOM And we're going to give you that extra 10 minutes there. (Garbled).

CAPCOM That leaves you about 20 minutes then you'll have to be moving.

CERNAN Boy, this pan may be looking - Okay. This pan may be looking right smack in the sides of the Massifs. Only way you can get it is to lean back and I can't lean down hill.

PAO Jack Schmitt taking a rake sample.

CAPCOM Hey, watch out for that crater behind you there, Geno.

CERNAN I'm standing in the crater so I can get level.

CAPCOM Yeah, we see that.

CERNAN But I took pictures of Nansen anyway, and -

SCHMITT When I look out there, I'm not sure I really believe it all. Bob, my down Sun pictures on the rake were taken at F8, I'm sorry.

CAPCOM Okay, copy that. We'll take it into account.

SCHMITT It's in the (garbled).

SCHMITT Okay, I got to get out of my shadow. I can't see what I'm doing.

CERNAN I'll be right down there to bag that rake for you.

SCHMITT I got to get it first.

CERNAN Man I tell you, can you come down hill in a hurry. Going up hill is a nice job.

SCHMITT Bob, I say we can meet our walk back in space if anyone's interested.

CAPCOM Okay. I expect it's all down hill from here.

SCHMITT Well, no sir. Not exactly.

CAPCOM You guys see the LM or are you down too far to see the LM.

SCHMITT (Garbled). Oh, no the LM is over about 3 rises in the scarp before we can even see it.

CAPCOM Okay, I thought that might have happened.

CERNAN You're looking - I'm not even at a lev - I'm not even at a level of the last hill we came over.

CAPCOM Okay.

CERNAN I don't see what's up that way.

CAPCOM Roger. We had a feeling for that. I'm just checking.

CERNAN We can meet them, but I wouldn't stretch them.

CAPCOM Okay.

SCHMITT Not many small walnut sized fragments in here Bob. Gotten about 7 or 8.

CAPCOM Okay. I copy that.

SCHMITT Gene, you got a bag?

CERNAN Yes sir. Right here.

SCHMITT How you doing? My hands are getting tired.

CERNAN That's 501.

SCHMITT Well, there isn't a lot, but that'll fill up a bag.

CERNAN This telegram sample site 2.

SCHMITT I'll have to look, I think so. I think they all are, aren't they?

CERNAN Roger, go ahead.

APOLLO 17 MISSION COMMENTARY 12/12/72 GET 143:16 CST 20:10 MC 565/4

CAPCOM And this is the one that we would like to
the kilogram of soil from, Jack.
SCHMITT Okay. I'll use my scoop for that.
CERNAN Bag 501.
CAPCOM Copy that, Gene.

END OF TAPE

SCHMITT Okay, what do we have left here?
CERNAN We want to get a - I got the high pan.
SCHMITT Let's see, let me look. They want it -
CERNAN I don't know how we used up all the time,
but we did. Okay, my pan's by the way. I got extensive vertical
coverage down into Nansen, Bob.
CAPCOM Okay, copy that, Gene. Thank you.
CERNAN I don't know where the hour went it took to
drive here.
SCHMITT Maybe time's different in space. Adventures
in space and time.
CERNAN We changed 2 hours and 40 minutes. I don't know
whether that makes us over or not but -
SCHMITT Ooops -
CERNAN Awrrrrrr -
SCHMITT Try again.. I got half of it. I got three
quarters of it.
CERNAN 502, Bob, will be the kilogram.
CAPCOM Copy that.
CERNAN And that's the sample down to about 5 -
about 4 centimeters -
SCHMITT Don't get too close to tell.
CERNAN Okay.
CERNAN Oh, that's a big bag full. Want to put it
in mine?
SCHMITT It's all right. I can't feel it. You might
as well -
CERNAN How's your cooling, okay?
SCHMITT Coolings fine. My hands are tired.
CERNAN Yeah, that's natural. Okay (garble).
CAPCOM Okay, and guys, if you see any more different
rocks that are worth sampling before you get down on to the flats
and sample the light mantle.
SCHMITT We haven't had a chance to look around any
more than you heard.
CAPCOM Okay.
CERNAN You want a rake and a light mantle here?
CAPCOM We want a rake and a light mantle. You
might as well get that down by the Rover later on and -
SCHMITT Get it after - get it after, Gene. Gene,
get it after.
CERNAN Yeah. Got it, got it, got it.
CAPCOM Then you might look around - there were a
couple of documented samples there -
CERNAN I'm sorry, Bob - go ahead.
CAPCOM - up close to the slope of the massif before
you move down the flatter light mantle areas by the Rover. Just
do the other sampling.
CERNAN We - we will. Okay, Bob, Jack got the before
on the rake and I got the after.

CAPCOM Okay, we have that.

CERNAN Okay, Bob, here are two rocks side by side, a meter or two in diameter, and one is the anorthositic gabbro if I can use the term, and the other is - is that two-cycle breccia.

SCHMITT Just don't stub your toe.

CERNAN Man, that's the way to come down hill.

SCHMITT Hey, Gene set up right there.

CERNAN Yeah.

SCHMITT Set up right there. Let's get that - let's get that big clast. There's a fram - a fracture I want to get near.

CERNAN Oh, the clast. Sure.

SCHMITT Yeah.

CERNAN Good eye, good eye.

SCHMITT Big white clast in the gray matrix fracture.

CERNAN Good eye.

SCHMITT Man, that's a prize. Let me get this over here so I can -

CERNAN I think you can even get it.

SCHMITT I can get both sides. I want to get this big - yeah, I think I can get that. I'm going to try. Oh, I can't believe the trouble I have with F stops. Okay. I'm going to try to take this piece off first.

CERNAN Pretty hard, isn't it?

SCHMITT That boulder's going to roll.

CERNAN Man, that is hard.

SCHMITT There's the same clast over there. Well, we get that clast is soft.

CERNAN You use your blade end?

SCHMITT Yeah. Yeah, let me get that little piece, anyway, to start with. Got it. There's two more pieces.

CERNAN Okay.

SCHMITT Before we cover them up, let's get them.

CERNAN I got to get a sample of that mother rock.

SCHMITT Okay, there you go. The other one's right there.

CERNAN Okay. Now, I'm going to see if I can't get a sample -

SCHMITT Want to try to hit that one more time - I think we've got another one coming there. There's another little one.

CERNAN That looks almost like a rhyolite from here. I don't believe it, though.

CERNAN No, that's not -

SCHMITT I think that's it. Got a bag?

CERNAN Okay, this is a fine grained but crystalline white clast in the gray breccia and it's mixed with soil - we had to pick up a little soil. 503.

SCHMITT I guess they're all there, aren't they?

CERNAN I think they are. There are three clasts,

anyway, or three fragments that we got off - chips. Let me get a piece of the rock it's in and I'm going to take a closeup stereo of that.

SCHMITT Okay, don't get it - okay.

CERNAN See it?

SCHMITT See it: You hit me with it.

CERNAN Well -

SCHMITT I tried to catch it.

CERNAN Bob, you still there?

CAPCOM Roger, still there listening with great delight.

CERNAN I believe we started the piece that came off there, Jack.

SCHMITT I got another piece of it up here. And I'd roll that down hill -

CERNAN Okay. The - the host rock for that inclusion of white material will be in bag - what is it?

SCHMITT 504.

CERNAN 504. Two chips with soil.

PAO Heart rate is running in the 90s.

CERNAN Getting heavy?

SCHMITT What? The Bag?

CERNAN Yeah.

SCHMITT No. Just the scoop - just like sugar -

CERNAN Just make sure they're closed.

SCHMITT I wore my hand out holding that camera together coming up here.

CERNAN We're getting some samples. I want to get a far and after I want to get some closeup stereos of that. I want to get some pictures around this block, too.

SCHMITT Okay. (garble).

CERNAN An after and now I'm going to get -

SCHMITT Take a closeup stereo around it. That oughta do it.

CERNAN Bob, while he's doing that, there's a real good example of big bottom crater up there even on this shallow slope. I'll try to take a stereo of it.

CAPCOM Okay, Jack, that sounds great. I guess there's always a problem of getting the in place clast if you think that's appropriate at this point. Word along those lines, though. We'd like your Rover moving in 11 minutes so it's probably not appropriate at this time on that.

SCHMITT Okay, there isn't any clast in this - this crater.

CAPCOM (garble)

SCHMITT It's just bigger - it's bigger than the average crater and it still has that pit depicting about a third of the diameter of the inner diameter of the crater - third of the - make it a fourth of the rim diameter, that's easier.

CAPCOM I'll copy that.

CERNAN Jack, can I look - can I look at that closely?

SCHMITT Look at what?

CERNAN Hold the rake a second. We got to be moving in how many minutes, Bob?

CAPCOM We'd like to have you moving in 10 minutes which means allow about the usual 3 or 4 or 5 minutes for closeout before that time.

CERNAN Okay, we'll get hustling.

SCHMITT Okay, Bob, that white colored inclusion we sampled looks like a strange -

CAPCOM Yeah, sure. It's the old boulder rolling trick.

SCHMITT I was getting a soil sample under there.

CAPCOM Don't hit the Rover.

CERNAN Get that - get that sample under there, Jack, under that rock.

SCHMITT Yeah, okay. Got a bag?

CERNAN Got a bag.

SCHMITT The soil from right underneath the rock down to about 4 centimeters and 505, and I'll try to skim it here a little bit, too. Get the upper parameter.

CERNAN Bob, these big white clasts. I'm not so sure they're not - they're not so some smaller ones in some of those other big boulders. That's just an intuitive guess.

SCHMITT Oh, they are.

CERNAN Well, I never saw any as obviously big and gross as this one. Such as this particular boulder I photographed, I had three of them other than the one we sampled. And that's 505 and 506 in that order.

CAPCOM Okay, we copy that.

CERNAN On the -

END OF TAPE

CAPCOM Standby now. Probably the best thing
for you guys - -
SCHMITT Bob, that rock - -
CAPCOM - - to do is to go back to the Rover and
pick up the rake samples. Go ahead, Jack.
SCHMITT That -
CERNAN I'll get it.
SCHMITT Okay. That clast, white clast, I looked
at it, and it has a light pastel green, fairly rounded crystals
in a fine grain white, light pinkish-tan matrix. And you can
figure that one out. Look like olivine and something.
CAPCOM Roger on that. Sounds like a rainbow.
SCHMITT It might be a - no, the colors aren't that
distinct, Bob. I was just giving you shades.
CAPCOM Okay, Roger.
CERNAN Hey, Bob, have you panned, down in the Nansen
rock that's oh, 30 or 40 meters from us to give you an idea
of the kind of upslope filleting you have on some of those
boulders.
CAPCOM Okay, we'll -
SCHMITT It's down to your right.
CAPCOM We'll send Ed over there to look at
it.
SCHMITT Yeah, I'll help him. I don't think you
got enough time.
CAPCOM Okay, we'd like you guys to get going on
the rake sample we like a handle on the rake there.
SCHMITT Okay, I'm gonna have to move out here
a ways, Geno.
CERNAN Coming right there.
SCHMITT Right there is what I'm looking at.
CAPCOM Okay, we're gonna check it out, thank you.
SCHMITT And there's no sense trying to get 500's
up well - -
SCHMITT Let's see what happens.
CAPCOM Also, we're running out of - there's no
time to get 500 meters, unfortunately, we're planning on
station 4 which will be a better perspective distance any how.
SCHMITT Yeah, I was going to say, there's no sense
in trying to get them up the Massif, I don't think you'll see
anything up there.
CAPCOM Okay.
SCHMITT Gene, you getting your pan?
CERNAN Yeah, I said where do you want it?
SCHMITT Well, right over there where there's some
fragments. And you get the -
CERNAN I'll get the before and the locator.
SCHMITT Okay, and then I'll get the down.
SCHMITT Okay. (garble)
CERNAN Yep.
SCHMITT Let me tell you, you just got to think

an order of magnitude bigger than what you normally are accustomed to thinking. Okay, pan's complete, let's get the rake sample so we can move on.

CERNAN Bob, I couldn't get those 500's anyway, they require me to pitch up too far and there's no way I could do it.

CAPCOM Okay, no, we're definitely not in favor of that, Gene, at this end.

SCHMITT I know, I'm just mulling it over, but there really is no way I could get them.

CAPCOM Okay.

SCHMITT Boy I tell you.

CERNAN How are your hands? Let me rake that a little bit.

SCHMITT Well, it's all right, there just aren't any rocks. Should have brought the scoop and used the old shovel trick. There's a couple, keep going.

CERNAN There sure aren't are there?

CAPCOM Okay, do you have any feeling - do you have that hard layer underneath there like you did yesterday when you raked at station 1?

SCHMITT There's one under the gnomon you can get.

CERNAN Several I thought were rocks turned out to be clods.

SCHMITT Yeah, that's what most of them are is clods. How do you get clods if it's never been wet?

CERNAN You're not getting any, you've had three in there ever since the last scoop.

SCHMITT There just aren't many.

CERNAN 507.

CAPCOM Okay, copy 507, very few.

CERNAN Three rocks. Yeah, you got about 4 rocks. About 2 inches and smaller.

SCHMITT And we get the down Sun which -

CAPCOM Okay, let's just get the soil and press on. We'd like to move in three minutes, 3 minutes.

CERNAN Okay, you got it?

SCHMITT Yep.

CERNAN Okay, let me put this in your bag and then we'll forget the soil.

SCHMITT Forget the soil?

CERNAN He wants us moving in three minutes. So let's go.

CAPCOM No, get the soil, guys, get the soil. Don't forget the soil, get the soil.

CERNAN Yeah, we want it.

SCHMITT I'm sorry, I thought you said skip it.

CERNAN Got your bag?
SCHMITT Yep.
SCHMITT May be a little messy.
CERNAN That's all right.
SCHMITT One scoop Smith, they call me.
CERNAN That's good. That's bag 508.
CAPCOM Copy that.
CERNAN Have to start putting some of these samples
in my bag, you're getting a full bag for Christmas here.
SCHMITT So full we ought to change it?
CERNAN Yep, let's do that after we get to the
next station.
SCHMITT Well, okay. We ought to start moving out
of here.
CERNAN Yeah, let's go.
SCHMITT Let me get After of the area that we messed
up.
CAPCOM Beautiful station, guys, just simply
beautiful. Almost deserves a Falcon Code.
CERNAN Man, I'll tell you. Falcon 109. I
couldn't help that Bob, it's just too beautiful.
CERNAN Hey, Jack, you reckon if we picked up
this stuff there's some light - well I can't see it now, I'm
looking in - -
SCHMITT I can see there's a light colored fragment
I think we break into.
CERNAN Yeah, we kick it up. They are light colored
clods. And when I was walking uphill I really wasn't expecting
probably more than an inch or two.
SCHMITT Why don't you - can you - want to take
this bag off me?
CERNAN Yes sir.
SCHMITT I'll get one out. We can use this one.
Yeah, cause we want to get rolling.
CAPCOM Okay, 17, there's a couple of things here,
while your getting undone there. (There's our housekeeping
to close out, change those bags we'd also like to get the set
turned on and you might read us the temperature when you turn
it on. And other than that stowing the TV and low gain
antenna and you're on your way. You've taken care of the
gravimeter already.
CERNAN What did it - did our reading change
much, Bob?
CAPCOM Which one?
CERNAN Make sure that's locked on there.
SCHMITT Yeah, it is locked, make sure the caps
locked.
CERNAN Okay, bag 8 is on the gage and Jack's getting
bag 4.
CAPCOM Okay, copy that. Copy that.
SCHMITT Boy, I know my camera's going to be --

CAPCOM Copy on the set receiver turn on and temperature.
SCHMITT Right. You got that closed?
CERNAN We got that, Bob.
SCHMITT It's closed, okay.
CAPCOM Okay, 17, take all that back, we've just had a change of heart back here. And we're not going to turn the set on, just cover it up and you might give us a temperature reading as you go by, that'll help us think what to do with it.
CERNAN About 98.
CAPCOM Copy 98. And leave them both off.
CERNAN Okay.
CAPCOM 17, John and Charlie are kind of advising you to put that SC, that full SCB underneath the seat to keep, make sure the top doesn't bounce open and loose some of those rocks.
CERNAN Well, you can't take better advice than from those who have been here.
CAPCOM Roger on that.
CERNAN Their advice has been pretty good so far.
CAPCOM I won't pass that on to them, I think they -
CERNAN These locks are clamming up, Jack. I can't unlock that one now.
SCHMITT Can you lock that one?
CERNAN They all get sticky.
SCHMITT That one just didn't want to work any more.
CERNAN Let me see. It isn't moving either way.
This one was sticky too, let me see.

END OF TAPE

SCHMITT Put it away.
CERNAN This one I - this one is sticky too. Let me see.
SCHMITT Out is open, right?
CERNAN Out is open, yeah. Let me try once more if I have to - Here I got it.
SCHMITT Okay, they really get dusty.
CERNAN I'll hit those with a dust brush next time around. Charge that time up to John and Charlie.
SCHMITT Okay. What haven't we done.
CERNAN I got to get the camera. Okay, Bob, I'm taking your camera.
CAPCOM Okay, looks like it's in the right place, as long as it's turned around. Good coordination.
CERNAN Yes sir. Okay, we read the TGE I'm going remote.
CAPCOM And give me a call when you guys get rolling.
SCHMITT Okay.
CAPCOM And we'd like frames when it's convenient on you guys.
PAO We'll be without a picture until the crew gets to station 3, which is at the base of the scarp about half way from station 2 to station 4 which is near the Crater Shorty.
CERNAN (garbled)
SCHMITT You did if I stop long enough.
CERNAN 113.
CAPCOM Copy. 113.
SCHMITT Oh, look at that. Boy I tell you. Okay, Geno, why don't I follow our tracks back, well, until we get over the big hump and we can start picking our way to 3.
CERNAN I've got 3 pretty well spotted.
SCHMITT Okay, okay low gain is set, and reading about 035. Oh, let me get this thing out of the way again - this has been giving me more trouble.
SCHMITT What's that? The hammer?
CERNAN Yeah, the handle.
SCHMITT Oh, getting caught in there?
CERNAN Okay, Bob, we're ready, we're rolling. You need any readings?
CAPCOM No, no readings called out and when you get going, I'll give you a little advise on what we're going to do on the way to station 3.
CERNAN Well, let me tell you a few things first, Bob.
CAPCOM Okay, start telling me.
CERNAN I think those two -
SCHMITT We're rolling.

CERNAN Those two major kinds of blocks that we sampled there, they were about the two varieties we saw in the area are it's a long extrapolation I realize but they do resemble in color and I believe in texture the blue gray rocks and the light tan rocks, upon the Massif, so I feel confident that - very confident that we sampled at least the two major units visible from a distance in the South Massif.

CAPCOM Excellent, excellent.

CERNAN I think that there is some - a lot of post-mission work to be done on correlating the angularity and possibly even albedos of the rocks we sampled with those on the Massif. We should have good - good pictures of them - of both from a distance and up close.

CAPCOM Okay, I'm reminding you that extrapolation is the nature of our art.

SCHMITT Ha ha ha ha ha ha, and Bob, I'm not going to - how am I on the film?

CERNAN Oh my golly, look at that valley.

CAPCOM Stand by. I'll get that for you, Jack. I can see you fairly well now. And before you guys get too far, a couple of comments we want to do on the way if there is a Rover sample stop in your checklist it used to be at the 073 and 6.3 it's the first thing there, half way out to hole in the wall. And we're now going to have that Rover sample stop at 078 and 7.0. That should be along your tracks going home. So about 078 7.0 we'll have the Rover sample stop and the gravimeter people have won today and we're going to stop and get off the Rover and get a gravimeter reading in that location. We're taking out this other stop, I'm not sure quite where. And right now, Jack, you're right on the film says a little note in front of me.

SCHMITT Okay, I'll take pictures then.

CERNAN Bob, we're on the top coming off the highest lobe of the scarp looking back into the valley and it's quite a scene back there but we still cannot see the LM. That may be it I don't know (garble) partial pan. I know it's into the sun. Wait a minute. Wait a minute. Okay, let's take one from right here. I want the whole thing. You ready to start?

SCHMITT Yeah, I got it.

CERNAN Start taking. Well, that's -

SCHMITT Take the whole thing.

CERNAN Go ahead. Get around that crater.

SCHMITT I got a pan down in the valley. This is just going to be right into the -

CERNAN Yeah, don't take that one, get it up as we come around.

SCHMITT You get it?

CERNAN There we go. Okay. That's the one we want.

SCHMITT And you got the valley?

CERNAN Yeah. Keep going.

CERNAN Okay. Keep turning around over there, and I'll get that scarp.

SCHMITT That's beautiful.

CERNAN Isn't that something? Man, you talk about a mysterious looking place. They can cut some frames - some parts of those pictures out and make a nice photograph. (Laughter)

TV cameras, maps -

SCHMITT Okay, looking at the north (garble) the light mantle. No more comments except that by that rake sample and just looking there's certainly - are fewer fragments than we saw on station 2. The main thing that we can tell about the light mantle and when we're on it of course, is the light colored craters. The fresher craters all appear to be light colored and as they get older they seem to the albedo goes down and potentially have been dusted with material from the dark mantle or from other sites. Either that or it's just the lunar patination that we're all familiar with.

CERNAN You know it's a shame they could have had TV coming down here because my heading isn't going to change much at all. The high gain could have been on the whole time.

SCHMITT Bob, none of the craters out here in the light mantle appear to show - they've got good bedrock. Almost all of them are instant rock crater.

CERNAN Say, Bob. Give me that bearing and range again for the -

CAPCOM 70 right here.

CERNAN What is it?

END OF TAPE

CERNAN 70 right here.
CAPCOM 07 and 7.0.
CERNAN - up on the hill. How about 071 and 70?
Will that do?
CAPCOM Yeah, I think that that will be enough
to hack it.
CERNAN Well, if not, we can go down there.
CAPCOM No, no, no, good lord. Stay on the
road - stay on the road you're on.
CERNAN Hey, I'm not on any road but I'm stopping
here.
CAPCOM I thought you guys were making a road -
CERNAN 071.
CAPCOM Roger.
SCHMITT Let me turn it off.
CAPCOM Yeah, also -
SCHMITT (garbled) 70.
CAPCOM Okay, and the Rover (garbled) fairly flat
for the old gravimeter.
SCHMITT Oh, oh.
CERNAN Well - that means we have to change here.
SCHMITT Hey, right over here to my right -
maybe it's the best we can do - but its still going to be
on a slope.
CERNAN Well, I'll level it off on local.
SCHMITT On it?
CERNAN Yeah.
SCHMITT Go ahead.
CERNAN I'm on. Do you see -
SCHMITT Yeah, I see it right there - on the rim
of that crater that's builded up a little bit? Right up here.
What's your - can you turn your roll? Okay, now that's about
zero right there. What's your roll.
CERNAN I'll turn this off roll indicator zero.
SCHMITT Zero?
CERNAN Yeah. I'll punch it.
SCHMITT You'll change it as soon as you get off.
You'll have to get off any way?
CERNAN Do I have to get off for this?
CAPCOM Roger, both of you have to get off.
CERNAN Why should I have to get off?
CAPCOM So you don't move the old gravimeter.
SCHMITT - gravimeter reading.
CERNAN Yeah, I'll hold still.
CAPCOM no, negative on that Gene.

CERNAN Okay, Bob. Give me your sampler cause
that's the other thing I have to do.
CAPCOM Yeah, we'll get bag samples here -
Rover samples at least..
CERNAN But you need me off to sample?
CAPCOM Roger, we want Jack - Gene and Jack both
off .
CERNAN Well, if you need me off Jack just punch
it.
SCHMITT Okay, hold still. They don't know any-
thing about your platen noise..
CERNAN (garbled)
CAPCOM Gene, we want both of you off.
CERNAN 071 9.8 and 7.0, Bob.
CAPCOM Got that.
CERNAN Don't push again - did you?
SCHMITT No.
CERNAN Okay, go ahead. Push it.
SCHMITT Let me wait until it settles down here.
CERNAN This thing is off tape start isn't it?
SCHMITT Oh - if this thing doesn't change.
CERNAN What if it does change - vibrate a
couple of times.
SCHMITT Huh?
CERNAN Vibrate a couple of times.
SCHMITT No, they're steady - oh I don't know -
yeah, they'll change.
CERNAN Okay, quiet Rover. Gravity, mark it.
CAPCOM Copy that.
SCHMITT Say, Bob, I need a quick F stop for the
500.
CAPCOM F stop.
SCHMITT It's the same. Its the same film.
SCHMITT Hey, Bob, can I punch it again?
CAPCOM Ah, yeah, going to stand by and then punch
it again.
CERNAN (garbled) time out, do you?
SCHMITT We're going to stand by.
CAPCOM Stand by, Jack.
PAO Ron Evans in America is on his 29th lunar
revolution. We'll be acquiring him in 14 minutes. In addition
to the experiments that he's been performing he's been doing
a considerable amount of visual science descriptions. Ron
is on his flight plan.
CAPCOM 500 millimeter should be the same as for
the 70.
CERNAN Okay.
CAPCOM And Jack, I presume you're getting some
Rover samples here off the Rover.
SCHMITT Bag 3 0 Easy.
CAPCOM Copy, 3 0 Easy. - Are you guys finding
much in the way of rocks, here.
CERNAN I'm looking. I can get you some instant
rock out of a small big crater - a bottom crater.

SCHMITT Bob, (garbled) at the top of the South Massif.
CAPCOM Okay.
SCHMITT Bag 3 1 Easy. Instant rock out of a 3 meter
big bottom crater - off the inner wall.
CAPCOM Copy that.
SCHMITT Well, let's make it 30 centimeters down
from the rim.
CAPCOM Okay.
CAPCOM Okay, 17, we've got about 30 seconds left
for that gravimeter reading (garbled) toward the Rover.
CERNAN Okay.
SCHMITT Okay, Bob, and (garbled) 57, the North Mas-
sif - from part of the western portions to part of the eastern
portions.
CAPCOM Okay, now and what was that frame count?
CAPCOM Okay, copy the 57.
CERNAN Here's something different - here's a
little -
PAO EVA time 3 hours 24 minutes.
CAPCOM Guys, we're ready for the gravimeter
reading. And we'd like a frame count from you, Jack.
Would you - (garbled)
SCHMITT A chunk of yellow-brown rock that
apparently has several spots behind it, probably indicating
direction from which it came - oh, no - what is that -
That's a reflection (laughter) That really fooled me.
A reflection off the Mylar (laughter) Baby. Well, what
the heck - I'll sample it anyway.
CERNAN Okay, let me get my antenna set so its
not quite -
SCHMITT 'Is it through reading?
CERNAN Yeah, its through reading - I'll -
Probably read it better by now, Bob. I've got Stanley mountain
and some of the hills way up to the right of Stanley Mountain.
I'm at 67 on the 500 and I'll give you the reading on the
gravimeter.
CAPCOM Okay, copy. 67 on Stanley Mountain.
CERNAN Did you get the other words on the 500?
CAPCOM Roger, copy them all.
CERNAN Well, you were reading at probably a
90 degree low gain angle.
CAPCOM Roger, we've been reading them on the
LM also.
SCHMITT (garbled) Easy, here's another small
fragment. You know what I need -
CERNAN Okay, 670 123501 - 670 123501.
CAPCOM Okay, copy that, Geno, and we're ready for
you guys to go on the earliest convenience.
SCHMITT Do you want me to load the LRV sampler?
CERNAN Go ahead. Yeah.
CAPCOM Jack is that you last LRV sample bags?
SCHMITT I only had one left but its loaded now.
CAPCOM Okay.
CERNAN You did get the reading, right Bob?

CAPCOM Roger, got the reading.
CERNAN Okay, we're buttoning up.
CAPCOM Okay, and if you've got something -
if you don't have one left for that sample at hole
in the wall Jack, we'd like you to get a new set of sample
bags.
SCHMITT We've got it.
CAPCOM Okay, got it still. Understand that 32 Echo
was your last sample.
SCHMITT 32 Echo. Got three here.
CAPCOM Okay.
CERNAN Oh, oh.
SCHMITT Okay?
CERNAN Yep.
SCHMITT Need some help?
CERNAN Nope. I've got the Rover.
SCHMITT Was that me?
CERNAN Nope.
SCHMITT That was interesting Bob about 2 inches
below the surface here you ran into that very - that blue-
grey material down there and it just - its in little clods
and it breaks apart in your hands.
CERNAN Yeah, that's right
SCHMITT Did you get some of that in your Rover
sample.
CERNAN No, but I got it out of that instant
rock crater.
SCHMITT Let's grab a quick Rover sample and we'll
take off.
CERNAN That's why that was a pretty interesting
episode.
SCHMITT Yeah, well you know we haven't been
trenching like we should.

END OF TAPE

CERNAN Well, you know, we haven't been trenching like we should or we would have -

SCHMITT But, really those trenches, those creators, are giving us the same information, that there's a light colored material underneath.

CAPCOM Okay, 17, we're ready for you guys to move on and we'd like to eliminate the Rover sample and hole on the wall.

CERNAN Okay, Bob, we're getting on now.

CAPCOM Copy that.

CERNAN We got on a minute ago.

CAPCOM And I understand that these Rover samples, Jack, are in your pockets.

SCHMITT No, they're in the bag on the Rover.

CAPCOM Okay.

SCHMITT 40 Yankee.

CAPCOM Copy that.

SCHMITT That's light colored soil from a depth of about, it's mixed with a little of the upper surface, but mostly light colored soil from a depth of about 15 centimeters.

CERNAN What would I do for an encore?

SCHMITT It looks like the light mantle in here is covered with dark to a depth of about 5 or 10 centimeters.

CERNAN You might want to go amend, Jack, on your diverter.

SCHMITT Right now I'm sort of warm.

CERNAN Okay, we start driving you might want to.

SCHMITT I'm going to DET myself with a cold. I can do it on here.

CERNAN Did you take any pictures at all while we were there.

SCHMITT Oh yeah, I didn't take a pan. Why don't you turn right to CRAV.

CERNAN Okay, Bob, if you read, we're rolling.

CAPCOM Okay, mark that.

CERNAN Making a right hand turn for a pan.

SCHMITT Left. Let me see where we're going, I guess (garble) In a little more and that hole would have been in the way. We left some of our litter.

CERNAN Not a complete pan but it will show the location. Okay, L & B frank out 8 0.

CAPCOM Copy that 8 0.

SCHMITT Okay, Geno, you're heading for a spot that about 0805 point 5 approximately.

CERNAN Okay.

CAPCOM Yeah, you guys following a track form or not?

SCHMITT Do you have an update?

CERNAN No.

CAPCOM Okay, and Roger, the hole in the wall should be at about 080 or maybe 5 point 7 and we're not going to stop and get a Rover sample at hole in the wall.

CERNAN Okay, that sound reasonable 'cause it's just nothing but just lots of rolling terrain.

SCHMITT Okay, Bob, I - I think we have a good sample of only partially contaminated light mantle in that last Rover sample that Gene accidentally discovered was right under our feet. It's almost certainly the light colored material is the grey that we've been talking about in the walls of the crater and as a matter of fact, that instant rock sample I took was light colored and probably represents the same stuff inderated slightly.

SCHMITT Light colored mantle has that bluish tint that you saw in those rocks.

CERNAN Yeah.

SCHMITT I still don't think there's anything we oughta - we oughta get a core in this light mantle some-time, and probably station 3 is going to be the place. I hope that's still in the agenda.

CAPCOM Rog, it's still in the agenda.

CERNAN Say, Bob, can you update the mileage on on station 3.

CAPCOM Okay, you want mileage to it or do you want the range and bearing added.

CERNAN Well, range and bearing added.

CAPCOM Okay, stand by.

CERNAN The hole in the wall is fairly nebulous.

CAPCOM Okay, we're going to say about 089 and 6741 for station 3.

CERNAN Okay.

CAPCOM Do I get another range and bearing right now?

CERNAN Do you get the feeling that we're the only ones out here, Jack. Look on the right - 073 10 point 3 6 point 6.

CAPCOM Copy that.

SCHMITT Bob, I have a feeling that what ever darkens the - ooh, there's a beautiful little black line crater, uh, dead bottom crater - whatever darkens the light mantle is not a - a one time only mantling of darker material. It's something that happens over a period of time, continually, because craters of all sizes and apparent degradation are darkened and there are lighter craters that are light to varying degrees, there seems to be a continuing - continuum of albedo change. You know that little crater on the side of the North Massif that we're thinking about going to doesn't look nearly as light colored or haloed as it does in pictures, does it.

CERNAN You mean - yeah - no. Now, let's see where we are, I don't want to run into that big crater at the foot of the -

SCHMITT I think you're almost to the ramp.

CERNAN Yeah, I want to go down here if I can.
my tracks are over there to the left, I haven't crossed them yet.

SCHMITT 073 6 point 3.

CAPCOM Copy that.

SCHMITT L&B frame count is 86.

CAPCOM Copy 86.

SCHMITT Boy, that's a sight, isn't it.

CERNAN That's spectacular.

SCHMITT I don't know why something that's all
approximately the same hue should - the lack of color has
got to contribute to the inability to judge distance.

SCHMITT See the lobes coming up - looks like
lobes out from the scarp. The scarp rather being a line
in there on the, on the plain, appear to be lobes.

CERNAN I got a couple of shots of that.

SCHMITT Whereas when it gets up on the Massif
it's a fairly contineous curve, although it does appear to
be younger at least, at least there's less relief on it
for the first 2 killimeters of that bend there.

CERNAN We're going to have to go down like
the way we came because there's that big crater down at
the bottom, I'm afraid.

CAPCOM Yeah, I think we agree with that
suggestion, too.

SCHMITT Bob, the scarp, so called scarp,
impresses me as less of a scarp than a series of, of lobes
which roughly have a north south trend and we've been
driving over various hummocks within those lobes.

CAPCOM Okay, copy that.

CERNAN I think we made a gross mistake in
not trying to learn good TV, my heading hasn't changed much at all
here.

SCHMITT Then we would have a spectacular
view.

CERNAN Look at it out in that valley, Jack,
now -

END OF TAPE

CERNAN Then, we'll have a spectacular view. Look down in that valley, Jack.

SCHMITT Yeah. Good Lord, I still don't know where the LM is - I see it, I think. The shadow or blob - that's the only sharp shadow out there right in the - because you sure can't make out the craters from here, can you?

CERNAM Okay, hold on. Over the hill and down the rail. Man, I tell you, this machine is fantastic.

SCHMITT Yep, Roger.

CERNAN Quite a machine.

SCHMITT Likes to spin when you turn going down hill.

CERNAN Quite a machine.

SCHMITT Watch it, I think you've got something right ahead of you. Here - see the instant rock.

CERNAN Here, I got it. You know the crater doesn't look nearly as bad from here but it sure is deep when you get up there. We'll just - I'll meander around its over next to the (garble) then I'll head down the next one - the first one we came up - and then along it.

SCHMITT Okay, there's Lara, and I think we can see station - Watch it, watch it, watch it.

CERNAN Okay, I'm going through it slow. Ha, ha.

SCHMITT I figured we'd buckle the LCRU with that one.

CERNAN I bet they can watch this road. My heart rate just dictates the kind of terrain we're going over.

SCHMITT Houston, we're navigating and not talking. Sorry. But the light mantle is a fair - is a uniform surface and I think you've heard just about everything we've had to say, so far.

CAPCOM Roger, your COMM's great and you guys are doing good work.

SCHMITT The fragment population is not - the fragment population has not changed, nor has the crater population, as near as I can tell. I hope the LRV photos will give you more details on that. Okay, Gene, do you have the target over there, that set of -

CERNAN Yeah, I got to get over to this next knoll and I'm going to be off the scarp.

SCHMITT We're about three quarters of the way down.

PAO Heart rates while on the Rover are in the 80s.

CERNAN Almost under the sun. It's gotta be. It's the only sharp shadow out there. Right under the sun, straight down there.

SCHMITT Probably.

CERNAN Okay, I'm going to try to make it down there. Just hold on.

SCHMITT This is what?

CERNAN This is the one we climbed up.

SCHMITT Oh, there's Nemo over there to my right.

CERNAN Yes sir, this is the one we climbed up.

Would you believe that?

SCHMITT Well, I don't know.
 CERNAN Yeah, I would.
 SCHMITT The problem is if there is any crater on
 the side -
 CERNAN I don't want to give it the roll, are
 you -
 SCHMITT I think you're all right.
 CERNAN We're all right. I don't know, that's got -
 SCHMITT Keep your speed down because if you have to
 turn, it doesn't like it on a downhill slope.
 CERNAN And that's got to be a pitch-angle (garble)
 and I don't know what that means. Okay. Right on time.
 SCHMITT (garble)
 CAPCOM You guys cut each other out but I take it
 that means you're at the edge of the scarp.
 CERNAN We're off, we're off, we came down.
 CAPCOM Roger, you're down the scarp.
 CERNAN Hey, did you look at the hill we came down
 fast as we went up?
 SCHMITT I'd rather not. Oh, I don't know, I'm
 impressed.
 CERNAN Okay, now where we going to go. 345 roughly.
 And we want to go to dual 876.1 -
 SCHMITT Okay, you're - I think you're headed right -
 right for where we want.
 CERNAN Yep.
 SCHMITT It's that bright - see that bright crater?
 You can just start to see station 3 over there now.
 CERNAN Okay, navigation says I've got (garble) degrees -
 I should be increasing range. Bob, we're at 07911.5 and 5.7.
 CAPCOM Okay, beautiful, guys. Really going smooth.
 CERNAN And I'm headed northwest.
 CAPCOM Roger. In fact, we understand it's been
 going so smooth down here that they haven't even spilled any
 coffee in the span room yet this mission.
 SCHMITT It ought to be.
 CERNAN Sorenson must not be on duty. I'm glad we
 don't have any sitting on the LCRU.
 SCHMITT Right over there is station 3, I think.
 CERNAN Oh, actually, I guess they would want it - is
 there - I'm just trying to see two craters -
 SCHMITT You know what the problem is?
 CERNAN And they're closer to Lara. I got a full
 planner view of the highgate and I can't see a thing out there.
 SCHMITT That's right.
 CERNAN Full planner view. All I can do is stay
 underneath it.
 SCHMITT Well I - gonna take it broadside.
 CERNAN See, I can't see a lot of craters now that
 I'm out in front. Oh, I guess I can see them both.
 SCHMITT Here's a nice sharp little hole, look at
 that. Bob, the texture of the light mantle - surface texture -

is really no different on the scarp on it's flank or out here to the east of the scarp. Fragment population, crater population, everything looking about the same. If there is such a thing as a light mantle, it seems to be uniform across the scarp.

CAPCOM Okay, I copy that, Jack.

SCHMITT Hey, your tracks - we crossed somebody's tracks - we sure did - we made a loop.

CAPCOM Hope they look like yours.

CERNAN That was 0815.7.

CAPCOM Okay, copy 081 5.7. Do they look like your tracks?

SCHMITT Here's another set.

CERNAN Yeah, this is where we went to the big crater and I came southeast in order to get around it, remember? We saw that hole?

SCHMITT Yep.

CERNAN Look at that big turn I made, ha ha. That was a quick change of mind when we came over that ridge.

SCHMITT Yes sir.

CERNAN Okay, we're still headed northwest, Bob.

SCHMITT Here - I -

CERNAN Okay, Bob, I guess one thing we don't have a handle on yet is what are the - I think we sampled them - once in a Rover sample, but what are the fragments out here mixed with the light mantle?

CAPCOM Okay, I copy that.

SCHMITT I think I got one in our last - our last gravimeter stop, a small one, and I guess there's one other Rover sample, but - station 3, we probably ought to make sure we get a representative suite of those fragments.

CAPCOM Roger, agree to that.

CERNAN Hey, Bob, how long have we been out?

CAPCOM How say there agin, Gene? How long have you been out?

CERNAN How long have we been out?

CAPCOM 3 plus 45.

CERNAN Thank you.

SCHMITT We're at 0835.7. Well, it certainly doesn't look like the geology of Norway, but it certainly is interesting.

CERNAN That must be Lara right there, huh?

SCHMITT Yeah.

CERNAN You can see the blocks on the other side of her.

SCHMITT That's right. I told them about those earlier. That's the only - no, I think, Gene, you want to bear a little bit - hold on - a little bit to the left. See those two craters, two bright craters, that are just this side of Lara?

CERNAN Now - well - I'm not -

SCHMITT You're pointed right - almost right at them, now.

CERNAN Okay, I can barely see them now through that high gain.

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SCHMITT Okay.

CERNAN But I can see - I know where we're going

now.

SCHMITT Those are the two I think they wanted us to
be at and I think that's a good choice if we can get up there.

CERNAN Bob, I want to get some 500 the way that
scarp flows up on top - well, it looks like it flows up on top
of the North Massif. Now it may look like the North Massif
may drop material down upon it. Look at that.

SCHMITT Yeah.

CERNAN Not really. The texture is so different.
It just doesn't look like as old a surface, but definitely
different.

SCHMITT Yeah.

END OF TAPE

SCHMITT Wish they had never said anything about pictures because I've tended to not take enough - to do better.

CAPCOM Okay, but Jack, you're doing quite well in the picture department - you're not getting too far behind or ahead. Copy that, Gene?

SCHMITT I mean I'm not getting the coverage I've - I'm not sure I'm getting the coverage I should.

CAPCOM Okay. We'll look at the frame count when you get to station 3.

SCHMITT Oops, oops, Oh, there's another big crater with a pit in it.

CERNAN What was it, 17 and a half or 18 clips we hit coming down the scarp, Jack?

SCHMITT I don't -

CERNAN I'm in midcooling now.

CERNAN Oh, look at that - wait 'til you get over and look at that (garble). Is that -

SCHMITT Yeah. I don't know where we're going to get a good - Well, let's see. You know, that big block up there might be worth going to.

CERNAN 087 at 5.9. I think that's the best station we got right here.

SCHMITT Well -

CERNAN Let's see what's over on your right. Let's see if we can get at that scarp over there.

SCHMITT I surely would have lost track -

CERNAN We're about there -

CAPCOM I think we expected you guys to be a little bit further north, we were getting a heading of 080 for the bearing which really kind of says you said you were going a bit further north than this.

CERNAN Yeah. Well, there's that first crater, there, Jack.

SCHMITT 080?

CAPCOM Roger. 080 is where we think -

SCHMITT All of a sudden I've lost track.

CAPCOM Stand by.

SCHMITT There's nothing wrong with that except that -

SCHMITT I think we ought to go back to that big block.

CERNAN Heading 080 is - Heading north is not going to -

CAPCOM Roger, I just realized that -

CERNAN I'm 087 now.

CAPCOM Yeah, I realize that, Gene, my mistake. Somebody's got a wrong thing down here.

SCHMITT Gene, I think -

CAPCOM That's the Hole-In-The-Wall. My mistake.

SCHMITT I think we need to go back there a little bit.

CERNAN Yeah, we're at 0876.0. I think that's probably about right, why don't we stop here?

CAPCOM Okay 17, that's a great stop. That was my mistake, I was reading the Hole-In-The-Wall coordinate.

CERNAN Sorry, Bob, we've got the boulders over here that are in the light mantle.

CAPCOM Okay, let me brief you on station 3. It's going to be a very brief station to make up for -

CERNAN We can see a little bit down into Lara, too.

CAPCOM Okay, it will be a brief station to make up for the time we added on at the - first of all remember we want to get the nav update. Let me go into a heading of 270 more or less and give us the nav readout so we can start that here.

CERNAN Can you get where you want from here?

SCHMITT No, this is no good. I wanted to get a high spot.

CERNAN Yeah, let's - let me park down here, Jack.

SCHMITT Why. You should have stayed up there.

This is good right here.

CERNAN It's not going to be very level for the gravimeter.

CAPCOM Gene, remember, we won't to first - head for the west so we can get the nav update.

CERNAN We'll park right out here and we can work those blocks right up behind us. Okay, you want a nav update here?

SCHMITT You need to get your antenna.

CAPCOM Roger, that's affirmed.

CERNAN I can get off, Jack. Oh, I was looking at the wrong damn - oh, no I'm not. I'll get a nav update. Get off and look around. I'll give them a nav update, Jack, and we'll press on.

SCHMITT Yes, sir, you're right, Bob.

CERNAN Hey, get your -

SCHMITT I will.

CERNAN Okay?

SCHMITT Go ahead.

CERNAN What do you need? Take your scoop or whatever you need.

SCHMITT Oh, you're going to move?

SCHMITT Yeah.

CERNAN Oh, I want to give them a nav update real quick.

SCHMITT Oh, I'm sorry, I -

CAPCOM Okay. And, Jack, straight for you. We're going to want you to do some document sampling on your own. I'll get with you guys on the rest of the station plans shortly. Go ahead, Gene, we're ready.

CERNAN Okay, I ought to get the gnomon I guess.

Okay, let me find the little fellow and come back towards you.

SCHMITT I'll get it. There is none.

CERNAN Well, okay, if you got any -

SCHMITT No, go ahead, make your park.

CERNAN Yeah, I'm looking for a level spot, but my God, there sure aren't very many.

SCHMITT That's probably pretty good.
CERNAN It will be in a minute.
CAPCOM (garble) to see all that level, Jack - Gene.
CERNAN Okay, 087 and 12.6, 6.0.
SCHMITT I got your gnomon.
CERNAN Sun shadow is zero. Pitch - if I can get
it over to read it. Pitch is - pitch is zero. Roll is zero.
How about one left, Bob?
CAPCOM Okay, copy. And how about that -
CERNAN About one left.
CAPCOM And how about headings?
CERNAN Heading is 282.
CAPCOM Okay, go ahead and park. We'll give you an
update when you get done.
CERNAN What else do you need?
CAPCOM That's all we need. Go ahead and park on
your 045. We'll give you an update when you get done.
CERNAN Jack, is one coming right there?
SCHMITT Looks like a pretty good location to sample
the rim materials of this crater.
CERNAN Bob, I'm at the south - let's say the east/
southeast rim of a - oh a 30 meter crater in the light mantle, of
course, up on the scarp and maybe 300 - 200 meters from the rim
of Lara in the northeast direction.
CAPCOM Okay, I copy that.
CERNAN It's body shows up as a bright crater -
a bright crater on your map. There's only about a half a
centimeter of gray cover over very white material that forms
the rim.
CAPCOM Okay, and Gene, give me a call when you get
parked and I'll see if we get an update give you an update on
what we want to do.
CERNAN Okay, I am parked.
CAPCOM Okay, we'll take the Rover readout first.
Okay, we'll take the Rover readout first.
CERNAN Okay. 087, 12.7, 6.0, 105 and 100. On the
battery temps 100, 120, The rear motors are off scale low and
the fore motors are 0 and 240.
CAPCOM Okay, we copy that. Understand that 240 now
instead of a 340. And what was your heading, 045?
CERNAN Heading is 043.
CAPCOM Okay. We copy that.
CERNAN If I ever gave you a motor temperature of
340, I think it was erroneous.
CAPCOM Okay, roger. And what we'd like you to do,
Gene is we'd like you to get the CSBC samples yourself, that will
essentially be your sole task at this station, Jack can do the
solo sampling and we'd like to get one pan
with the gravimeter and then we'll leave this station. We're
going to absorb some of the time we spent for the extra gravi-
meter reading and some of the time we absorbed at station 2

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in the longer stay time in sampling at station 3. That's our plan. So it will be CDR for the CSBC for the long cans, excuse me and LMP for solo sampling and then a pan by Jack, I presume and then a gravimeter and then leave. And Jack, you might check your film. We aren't quite sure where you are right now before you get too far from the Rover.

END OF TAPE

CERNAN Okay, Bob.
CAPCOM TV coming in now.
CERNAN Bob, you got any, Bob, you got any
preference up in this area where you want that logged in?
CAPCOM Negative. That's something that was
so near the scarp that you're parked pretty near the
scarp and that something that when we do it in solo, we only
did it with the Rover, so you'd have to stay right there
beside the Rover and do it. No expectations of doing it
otherwise.
CERNAN Man, that's what I figured. Yeah, I
think you're in good shape. Yeah, I don't think we have
any other choice. Matter of fact, if there is a scarp, and
if it is a flat we're right on it because the projection of
it would be up hill a little bit.
SCHMITT Yeah, I'll be right on the side of it.
I'm parked on the side of it if it exists.
CAPCOM Okay, and Jack, what's your frame Comm?
SCHMITT Well, 1, uh, 122.
CAPCOM Okay, copy that (garble) Go ahead, Gene.
SCHMITT What do you need, Gene?
CERNAN Oh yeah, Bob, I dug a trench in the
side of this crater. I've got downsun pictures of it.
There is quite a marbling of light and dark soil or fine
grain material. It looks as if there's a uniform about 3
centimeter layer of light material over that marbled light
and dark. On the very top surface there's a half centimeter
of light grey, when I say dark, I mean a medium grey.
CAPCOM Okay, copy that. Sounds like a great
sample site.
CERNAN Okay, I'm going to start sampling the
soils and then I'll get you the fragments.
CAPCOM Okay, I presume that we'll at least have
the single upper core which we can use to sample that stuff
in the soil and we -
CERNAN Oh, there's no guarantee this is a
crater rim.
CAPCOM Okay, and Gene are you still near the
Rover.
CERNAN Yeah, I am.
CAPCOM Okay, we'd like to get the SEP blankets
opened, Gene, and dusted if they're dirty, so they can
cool some more.
CERNAN Oh boy.
CAPCOM Yeah.
CERNAN Okay, now I can't give you the gravimeter
reading while I'm working on the Rover, so I'll have to time
it when I get away from it.
CAPCOM Okay, Roger on that. I think you'll
be pounding on the hammer for a long while while you can
take the Rover gravimeter reading.

CERNAN Yeah, well we'll see. Let me get your brush back. Okay, bag 520 has a skin sample of the upper light grey soil. Don't know where I'm going to put these things, I've got to come down and get a bag.

SCHMITT Have you punched the drill - no.

CERNAN No, I can't punch it until I get out of here.

SCHMITT These switches are on OFF stand by, right?

CERNAN They should be.

SCHMITT Okay, that's where they are and the temperature is a hundred, about one hundred and four and -

CERNAN No, they should be off, isn't it off?

SCHMITT No, it was stand by.

CERNAN No, push it off.

CAPCOM Okay, it doesn't matter whether it's stand by it won't be heating that temperature anyway, but put it off.

CERNAN Okay. it might have gotten hit when I changed the blanket. Now I have to go to intermediate cooling here.

SCHMITT Got me with a cold. Imagine those (garble) got charged okay last night.

CERNAN Okay, back to intermediate. How's Ron doing.

CAPCOM They're both looking, uh, stand by, I thought he said both, fine. Ron's doing great, too, he's sitting here busily -

CERNAN No, no.

CAPCOM Go ahead.

CERNAN I mean, Captain America.

CAPCOM Yeah, I'm just inquiring of Bob, I think he's doing great. He's just passed a little bit north of you a couple of minutes ago and took some pictures of you.

SCHMITT Okay, I do my work around the LMP seat here.

CERNAN That's locked. That must be unlocked.

SCHMITT Okay, unlock. Break is off. 4 is coming in. Okay, Bob, the upper, the upper 5 centimeters, uh, 3 centimeters mixed with that upper half centimeters, is the next sample.

CAPCOM Copy that.

CERNAN Okay, Bob, I guess I'm going to go farther a way and Jack, I'm going to hit the gravimeter.

SCHMITT Okay.

CERNAN Okay, mark it.

CAPCOM Copy that.

CERNAN And 521 is the sample bag.

CAPCOM Copy that.

CERNAN Well, the first core has gone down pretty good, Bob.

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CAPCOM Okay, great.
SCHMITT Oh, you're not going - you wont have
any problem in here coring.
CERNAN Oh man, I tell you, I wish I was putting
a drill hole in here. Looks pretty nice.
PAO Each of these drive tubes is 16 inches
long.
SCHMITT Okay, Bob, the next sample is mostly the
medium grey uh, fraction of the marbling, it's mixed though.
That's in bag 522.
CAPCOM Copy that, Jack.
SCHMITT Okay, I think I got it. I think I
got it, Bob.
CAPCOM Okay.

END OF TAPE

CAPCOM Jack, when you get one (garbled) you might hit one - two of those blocks there, but then we'd - cause they're really going to cut this station down on minimum after that you'd probably better get to the pan.

SCHMITT Bob, what do you think, can I read a gravimeter?

CAPCOM Yeah, if the light's flashing.

SCHMITT The light's out.

CAPCOM Yeah, it should be just done.

SCHMITT 670 049701 670 049701.

CAPCOM Okay, I copy that.

CERNAN Bob, the - the white marble in the - the white fraction in the marble zone in 523.

CAPCOM Copy that.

SCHMITT Bob, I forgot to give you the Core numbers, but I will.

CAPCOM Okay. And don't forget to put your little note in the long pan there.

SCHMITT Oh, I'll get the note in there. I'll get it in there. Nobody will ever know.

PAO Gene Cernan extracting the drive tube.

CERNAN Okay, Bob our 524 is what I think is a blue gray rock probably breccia. It's got a little dust on it.

CAPCOM Copy that.

CERNAN From just off the rim of this little crater.

CAPCOM Okay copy that. It's a blue-gray rock, it's not part of the trench right? You finish the trench.

CERNAN Yes. As you see, Bob, it's full. See that?

CPACOM Roger. we see a long thing in your hand there, Gene.

SCHMITT Well, I didn't think that was supposed to happen.

CERNAN And I'd know, Jack? Shoot. Thought I had them on the Rover.

SCHMITT What?

CERNAN Oh, the core cap cover. I'll get them.

SCHMITT No, you got some there in that little pocket in that little pocket. Yeah, and there's so many bags in here, I can't get out. No I mean the pocket on the Rover on the back. Remember?

CERNAN No they're not. I took them out and put them on you.

SCHMITT Oh, okay.

CERNAN They're up there in that bag. I'll come get them.

CERNAN This other - but I don't want to get into your seat. We got those bags packed in there like gangbusters. How are you doing there by yourself?

SCHMITT Well, it's hard.

SCHMITT Your hook came off and if you wait a minute, I'll hook it on this bag. See. See.

CERNAN I never - I didn't think the sample bag could come off the camera. But they can.

SERNAN Yeah. Doggone it.

SCHMITT What's your problem?

CERNAN Just as well fix this bag now. Let me get this bag - it's going to come off at the bottom if we don't. It's not going to come off again I don't think. The harness is tight enough now.

SCHMITT Want to tighten the harness?

CERNAN Yeah, I got to, Jack.

SCHMITT Okay. Let me get your harness - I might just as well do it so it's right. If it's worth doing at all, it's worth doing right.

CERNAN Now, let me try getting that bag back on. No, don't bend over, I can't get down there.

SCHMITT Okay.

CERNAN You're plenty short enough - is short enough.

SCHMITT Thanks - thanks a lot. (Laughter).

CERNAN Just think, that hook - or something changes in the geometry.

CAPCOM Okay, don't worry about it too much guys, I'm sure the bag will stay on without the hook.

CERNAN Yeah, (garbled) the conclusion I just came to.

SCHMITT You through?

CERNAN Yeah, go ahead.

PAO EVA time 4 hours 10 minutes.

CERNAN Okay, Bob, what I know is a blue-gray breccia is in bag 525.

CAPCOM Okay, copy that. And Jack you just skipping up little rocks along the way here. Your little xenolith mode. Still listening.

SCHMITT Yeah, you read my mind. I do want to get one of these light colored rocks though.

CAPCOM Go ahead Gene.

CERNAN Bob, the - when I broke the cores apart, there's just a lot of dried clods and - and the bottom core's full, the top core about - oh, I got to look - it's dark down there but about an inch - inch and 1/2 of the core is just zero g to 1/6 g itself right out.

CAPCOM Okay, we copy that. I guess we'll just cover it and see what we got. Might just again trying packing it after that's through. After you're done with the roller core.

CERNAN Yeah. I'll do that.

CAPCOM And Geno, how about

SCHMITT bag 526.

CAPCOM Copy 526.

SCHMITT Okay, in a long can - I'll give it to you wait a minute.

CERNAN That may have been a piece of gabbro. But again - -

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SCHMITT I can't be completely sure.
CAPCOM Copy that. Go ahead Gene.
CERNAN It's either that or anorthositic gabbro we
saw up on the Front. Up on the Massif.
CAPCOM Okay.
CERNAN And my bags aren't staying on my camera worth
a darn.
SCHMITT 46, Bob, is going into the long can.
CAPCOM Copy that.
SCHMITT Boy, another exercise in dexterity. Okay,
LMP has gone to intermediate.
CERNAN And by the way I'm at about 49 percent and 3.85
and intermediate cooling and no flags.
CAPCOM Okay, copy that Geno. Have you got a number
for the upper core when you done - I guess you're probably putting
the other one in the long can on you right now.
SCHMITT Yeah, yeah, yeah, that's right.
CAPCOM And somewhere here along the line, Jack, I
guess maybe when you get those you ought to stop and take the
pan.
SCHMITT Okay, Bob. Okay, Bob the the lower can is
sealed and I guess nobody knows what's in it but me.
CAPCOM No one ever will probably.

END OF TAPE
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CAPCOM No one ever will, probably.
CERNAN I may not - I may not even tell.
SCHMITT It does not - none of the material in this core, in either the top section or the bottom section, look unlike that - that stuff just beneath the surface that we sampled at that special stop back there. Its a bluish-grey and it turns to clod and breaks up in your hands. And that's core 31 - the number is 31.
CAPCOM Copy. 31 on the other.
CERNAN Oh, man. Bob, you've got better than - oh, you've got two-thirds of a quart after I packed it down a little bit.
CAPCOM Okay, thank you, Geno. Copy that.
CERNAN Okay, that little set of 4 samples is in 527.
CAPCOM Okay, we hope it was worth the effort.
CERNAN Oh, its all worth the effort - it just hurts.
CAPCOM Okay. We're ready now for your pan and don't forget your scoop.
CERNAN I won't - ah -
SCHMITT You don't mind a little dirt here and there, do you Jerry?
CAPCOM No.
PAO Jack Schmitt having a few problems.
SCHMITT Oh, dad-gum it. Well -
CAPCOM Hey, Gene, would you help - would you go over and help twinkle toes, please?
SCHMITT I tell you - you fix that camera bracket so the backs stay on and I'll be a lot better off.
CAPCOM Roger.
CERNAN Want some help, Jack. I'll be there.
SCHMITT No, I don't need any help.
CERNAN Okay.
CAPCOM Jack, you might worry about whether your camera lens is dirty or clean, Jack. I don't know what you could do about it.
SCHMITT I'm very worried about that.
CAPCOM I don't know what you could do about it but you might worry about it.
SCHMITT I don't have a thing to do - It's clean.
CERNAN Well, I'll be a son of a gun.
SCHMITT What's the problem?
CERNAN (chuckle) I can't get this rake locked out.
SCHMITT What the -
CERNAN The rake.
SCHMITT The rake?
CERNAN That should lock - I turn that like that - there it comes.
SCHMITT Jack, have you ever started to pan so we could get an EMU check on you?

SCHMITT Well, its about 50 percent. About 385.
CAPCOM Okay, copy that.
SCHMITT And no flags.
PAO Jack Schmitt taking a 360 degree panora-
rama now with the camera.
SCHMITT Okay, that's all put away. That goes
back on your back.
CERNAN I'll get it.
CAPCOM Why don't you go over and - over towards
Jack, Gene, Gene and then the two of you can pick up the
scoop and the bag together and get back towards the Rover
after that?
CERNAN Yeah, I'm cleaning up this seat here.
I'll do that. I think I can hack it.
CAPCOM Okay and then at that point we're ready
for you guys to leave.
CERNAN Whew - Okay.
CERNAN Jack, I've got the rammer I've got to
put on you. Do you want to just leave it on your seat right now?
SCHMITT Okay.
CAPCOM We're watching you, Jack.
CERNAN What's that?
CAPCOM I said we're watching you, but don't
let that inhibit you.
SCHMITT I don't - Bob, I don't let anything
inhibit me - and I don't stay mad very long.
CAPCOM That was very good.
SCHMITT (laughter) Well, there's an easy way
to do everything. The question is, can you hang on to it once
you've done it.
CERNAN Let me get those, Jack. Don't get down
there. Let me get down there. Where are they?
SCHMITT They don't stay on my camera anymore.
CERNAN Well, we'll fix it. There's no reason
why they shouldn't according to this. But there are a lot -
SCHMITT (garbled) The sample from that - oh -
I need it - wait - take an after - crossing from over to the
north of the gnomon.
SCHMITT You didn't get an after, huh?
CERNAN Nope. How could -
SCHMITT Oh, I'll get it .
CERNAN If you don't mind this thing, just leave
it there.
CERNAN Bob, what else do you want us to do here?
CAPCOM Nothing. Get on the Rover and leave.
Get the heck out - don't forget the gnomon.
SCHMITT Okay. We're going back to get that after -
and we won't forget it.
SCHMITT I think you might be able to decipher
this station, Bob.
CAPCOM That's the general idea. And be advised
that the switchboard here at MSC has been lit up by calls
from the Houston Ballet Foundation requesting your services
for next season.
SCHMITT I should hope so. Well, we can't use that

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SCHMITT one. The right hand gatelock is - how's that - nonfunctional and the left one is almost nonfunctional.

CAPCOM Okay.

SCHMITT We - once you get it open you can't get it locked. I'll adjust it if I get a chance but it's locked on the left side.

CAPCOM Okay, well, we'll keep those bags under your feet anyway.

SCHMITT Here, I'll work on it.

CAPCOM I think the samples are safer under there anyway.

SCHMITT We don't have any room. (garbled) ... we can take bag 7 out.

CERNAN That one is locked - in good shape.

SCHMITT Let's press on. We got the reading? Let me put the rim around your back and see if we can't get this - on your camera.

CERNAN Are we going to run the SEP this time?

SCHMITT I don't know, he hasn't said anything. I expect he will.

CAPCOM No, we will not turn the SEP on Jack, and cover it with that blanket as well as you can. And how about temperature reading before you leave as soon as you do that.

CERNAN It's 100.

CAPCOM Copy that. 100, and understand both switches are off and the covers are closed.

SCHMITT Well, the covers are closed now. They weren't.

CAPCOM Okay. Roger. That's what I mean.

SCHMITT Turn the other way, left. I think it might just put you there.

CERNAN Well, I don't know why it isn't staying on but it certainly isn't.

SCHMITT (garbled) Move over there.

CERNAN Okay.

CERNAN Is that the same one.

END OF TAPE

SCHMITT Is that the same one? I may have bent it.
CERNAN I think you did now. Yeah.
SCHMITT I just bent that, didn't I?
CERNAN Yeah, that's not going to stay on.
Yeah, you bent it very well.
SCHMITT Wonder how I did that.
CERNAN I don't know you're losing badge.
SCHMITT Okay, well, we'll -
CERNAN I got badge.
SCHMITT We'll revise our procedures.
CERNAN I got badge.
SCHMITT I guess I'll bend my camera mounting brack uh, point, the camera point (garble).
CERNAN Turn around we may have to -
CERNAN Think about a fix there. We might be able to fix that in the cockpit.
SCHMITT Yeah.
CAPCOM Okay, uh -
SCHMITT Okay, are we all through, have you got -
CAPCOM worry about that right, when you get back in.
PAO Jack Schmitt waving.
SCHMITT Okay, where are we here.
CERNAN I'll get on.
SCHMITT Okay oh, I guess I need to get another film mag, huh.
CAPCOM Okay, how about frame counts on both you guys before you start.
CERNAN 152 on the LMP -
CAPCOM We suggest Magaline - uh, magazine Juliet, please.
CERNAN (laughter) Okay, we'll get Magaline Julieing it's PDR on 118.
CAPCOM Okay, copy that, Geno.
CERNAN Fire fire, two frames. You know, I'd enjoy this if it wasn't so much fun. Okay, you going to change your MAG.
SCHMITT Yeah.
CERNAN You do 500 while you're doing that.
(laughter) Listen to me -
SCHMITT Yeah.
CERNAN Look at my thumb.
SCHMITT I know.
CAPCOM 17, we'd really like the -
CERNAN Anytime you want to do something, though.

CAPCOM We'd like to press on as quickly as possible.

CERNAN I got it.

SCHMITT Got it.

CERNAN Got it.

CAPCOM In case you didn't get.

CERNAN Take a portion of the Scarp over there you can see.

CAPCOM 17, do you copy? Houston.

CERNAN What?

CAPCOM We'd like to press on -

CERNAN What?

CAPCOM As soon as possible, please.

CERNAN Yes, we are, Bob, but - but he's got to change his mag.

CAPCOM Roger.

CERNAN I'm going to stand here and look around.

CAPCOM Okay.

SCHMITT Okay, I'm picking up with mag - with frame 56 and I'm going to try to get a little bit of where the scarp overlaps the North Massif. I can't see much of it. All I could get was 3 frames of that. Now I'm picking up the South Massif.

PAO Jack Schmitt, changing the film magazine in his camera.

CERNAN Okay, how are you coming, Jack?

SCHMITT Okay. Oh, I ought to put that in there so you've got room for your camera.

CAPCOM You got a final frame count there, Gene?

SCHMITT Okay, I'm all set.

CERNAN Okay, Bob. When I finished with South Massif I was on 94 and I took - now I'm on 99 - I took 5 more pictures back over to the northeast.

CAPCOM We copy that. And we assume you guys are ready to go by now.

CERNAN And Bob, they were all with the lens -

Yes sir - they were all with the lens cap off.

CAPCOM Splendid.

CERNAN Okay.

CAPCOM Okay. And Jack, what's the headings say? And we'll -

SCHMITT Why don't you fix that high gain so you can see.

CAPCOM We'll - we'll get the reading we need for the NAV update. Do you think you can give us the heading right now?

SCHMITT Okay, heading is 4 - better let Gene do it for you.

CAPCOM Okay. Do what?
SCHMITT I got some - gee, I've got some (garble).
I think it's 41 though.
CERNAN What you looking at?
SCHMITT The headings.
CERNAN 43 - 043 is what I gave them earlier.
CAPCOM Yeah, we were wondering if it drifted
while you were there because we're going to give you now a -
CERNAN Bob, let me -
CAPCOM Give you one to update it to if it has
drifted at all.
CERNAN Okay, did drift, 041 is a good number.
CAPCOM Okay. Stand by.
PAO We'll get a picture back at station 4
which is the crater, Shorty.
SCHMITT I'm strapped.
CERNAN You liked the drift, huh?
CAPCOM Great.
SCHMITT Okay, I'll - dad gummit.
PAO Estimated driving time 16 minutes.
SCHMITT Every time. Okay, let's go.
CERNAN All right, sport.
SCHMITT I'm going to head
CERNAN - we didn't really do all the things we wanted
to do but I think we did all the things we could.
CAPCOM We did all the things we wanted (interruption).
SCHMITT Okay, let's get ready to roll.
CERNAN By line stereo.
SCHMITT Okay, Bob - Ohh -
SCHMITT You got the GDE camera on and the low
gain is 060.
CERNAN You get the gnomon in?
SCHMITT Didn't you get it?
SCHMITT Wait a minute.
CERNAN You took the after.
SCHMITT It's not sitting out there.
CERNAN No, I thought I handed - didn't you
stick it in?
SCHMITT Yeah, I stuck it in. I got it.
CERNAN Okay. We can look back. (laughter).
CERNAN Bob.
SCHMITT I sure thought I handed it to you, Gene-o.
CERNAN You did and I put it in.
SCHMITT Okay, that's good.
CERNAN Okay, whoo boy, rest the old hand.

CAPCOM Okay, with recommendations we minimum
the evening, Jack.
SCHMITT (garble) ejecta. It's double.
SCHMITT I think I am in minimum.
CAPCOM Jack, (garble) - Jack.
SCHMITT I am already. Yeah, I'll go to minimum.
SCHMITT Yes, I will.
CAPCOM And give us a mark rolling, please.
CERNAN Yeah Bob, I gave you one. We've been
rolling for about 30 seconds.
CAPCOM Copy that.
CERNAN We're at 087 12 - 087 and 5.9 on the
range.
CAPCOM Copy that.
CAPCOM And the drive to station 4 will be
nominal and we'll get a rover sample at about 094 5:1 but
it will be the track as indicated on the map and the cup
check list.
SCHMITT Okay. Going to Shorty.
CERNAN Okay.
CERNAN On our way.
SCHMITT You got your check list there?
CERNAN Yeah, I got it in front of me.
SCHMITT Okay.
CERNAN And, we're heading - heading to 069,
around - well up - I got it -
SCHMITT Yeah, that's pretty close.
CERNAN I know we're next to that band but
I know where we're going. My next is 0945.1 is what I want.
For that sample.
SCHMITT Yeah.
SCHMITT O what?
CERNAN I think he said 0945.1.
SCHMITT He meant - 052 is what's nominal.
SCHMITT What's the sample again, Bob?
CAPCOM 5.1. 0945.1.

END OF TAPE

SCHMITT Oh, okay, that's a heading.
CERNAN All right.
SCHMITT You got 451.
CERNAN Yes, got it.
CERNAN Drive by this big rock? Want
to look at it, you can't see it. I can't see when that off
LCRU shines into my eyes.
SCHMITT Looks like one of the gray breccias.
CERNAN Big 3 metered - 3 to 4 metered block out
here all by itself on the light mantle - I got some pictures.
It was at 0885.6.
CAPCOM Okay, copy that.
SCHMITT And it looked like a gray breccia, I'm
not sure though, all I could see was the serpent texture,
and it had the modular or elongated, modular texture that
those breccias had up on the South Massif.
CAPCOM Okay, copy that Jack.
CERNAN Where are you Shorty? And the battery
temperatures are 100 and 130.
CAPCOM Copy that.
SCHMITT Okay, Bob, as far as any of the things
we talked about trying to see at the surface, dynamics or
a variation of the light mantle, I think you've heard it all,
there isn't much to say about the dynamics right now. I have a
feeling that the surfaces are old enough that all those
kind of detailed relationships have been obscured. Solenoid
is just about the same all over here, it varies, but there
are no systematics that I've seen.
CAPCOM Okay, copy that. Do we ever see a
Rover flag come up when you've got high temperatures there
on the battery - have you seen the flag up yet?
SCHMITT No, you didn't. No you did not, you did
not.
CAPCOM Okay, that may be telling us something,
we hope. Press on.
PAO And Ron Evans in America are about 13-1/2
minutes away from loss of signal on the twenty- ninth lunar
revolution. Ron will be getting his evening meal within a
few minutes, and in about an hour and a half will begin his
rest period.
SCHMITT Ought to cut left up here a little bit.
CERNAN Yes, I think so.
CERNAN Oh.
SCHMITT Keep her going.
CERNAN Good lord was that a - does the aspector
slow that little thing.
SCHMITT Yes, that's what they call a pit crater.
Can you swing a little bit and let me get that fragment
crater - see that one on your left there?

SCHMITT - quite a scene up here.
CERNAN Got your pictures? Pictures?
SCHMITT Yes, I got them.
CERNAN Okay, Bob. We're at 0905.3 for a quick
Rover stop of a very fragmental crater. The ejecta is about
50 percent small angular fragments, much different then we
have seen before in terms of the type of patterns.
CAPCOM Okay, copy -
CERNAN Okay, and that's in bag 41 Yankee.
CAPCOM Copy that.
CERNAN And we're on our way.
CAPCOM Great.
CERNAN Get your picture, Jack?
SCHMITT Yes. LMP frame count is 15.
CAPCOM Copy that.
CERNAN About a 30 second stop. Okay, 094 -
I'm 0905.3 now Bob. We're heading toward your stop.
CAPCOM Okay, 0905.3.
SCHMITT Bob, I couldn't tell whether that was just
it looked like that might have been a crater that it got to
bedrock, it may have been a high point or let's say a thin
point in the light mantle, and it got down to bedrock, but
I can't. It's the most blocky rimmed crater we've seen for
a long time.
CERNAN See all these others are nowhere near
that - look at that.
SCHMITT It was about 15 meters in diameter.
CERNAN Bob, there are no obvious radiations at
the scale we can observe on the light mantle. I think the
band photography and the metrics (garbled) may be what you'll
have to use for any directional trends out in here, depending
on what we decide the origin is.
SCHMITT Bob, are you still reading?
CAPCOM Roger, we're still reading you, Jack.
CERNAN Are you reading it through the LM or
through the low gain?
CAPCOM As far as I can tell, we're reading you
through the low gain. It's been working just great tonight
Geno.
CERNAN Okay, that's great.
SCHMITT Tonight.
CERNAN Cause I just scraped bottom on the LCRU,
if it's still working, I'm glad to hear that.
SCHMITT Okay, 093 and 5.0, almost there.
CERNAN We're right on the rim of that crater.
CAPCOM Okay, and 17, the word from the back room
is - with that last Rover sample you got we'd like you to
go straight to station 4 - and we won't get the one here at
094 and 5.3, 5.1, excuse me.

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SCHMITT Bob, I thought the purpose was to sample
the light mantle?
CAPCOM I was - talked to them about that, but
they -
SCHMITT We sampled the light mantle at that last one.
CAPCOM I agree, I talked to them about that, but
they are so anxious to get to station 4, I guess they don't
want to do it.
SCHMITT Well, how about it Gene, a little real
time -
CERNAN I think we got to right here.
SCHMITT I think we got it.
CERNAN 0945.1, you got your picture?
SCHMITT Yes. Okay, that's good enough.
CERNAN Happy.
SCHMITT We're getting a sample anyway.
CERNAN Okay. 0945.1.
CAPCOM Copy that.
CERNAN That's good Jack. Dap is in 42 Yankee.
CAPCOM Copy that.
CERNAN And we are rolling, and give me a bearing
and a range to station 4.
CAPCOM Roger, it will be a bearing of 100 and a
range of 4.6.
CERNAN Okay, we're now at 5.0 - 94 and 50.
SCHMITT LMP frame count is 25.
CERNAN Was that 100 - 4.6?
CAPCOM Roger, Gene.
SCHMITT Houston, there aren't very many rocks
that just sit on the surface. All of them seem to be slightly
buried to moderately buried. That one looked like it might
be vesicular. There's a trench - linear kind of crater.
CERNAN Hold it Babe, we got to make a little detour.
SCHMITT Okay, 14 and 101 -
CERNAN At 1004.6 I'll detour, I'll just get
down this slope. I don't see Shorty though, do you?
SCHMITT Wait a minute, is that it? Is that it
out there straight ahead?

END OF TAPE

SPEAKER Is that it out there straight ahead?
CERNAN Well let me get down this slope, dark out there. I think that's it. The dark - it might be right over to the left a little bit.
SPEAKER Your left, yeah.
CERNAN Yeah, right over there, I think I can cut right across here, that's going to be about the right place.
CERNAN Seems a little far from here but maybe not.
SCHMITT Oh, I forgot to take the pictures again, trying to shade my eyes.
CERNAN That Scarp certainly is spectacular going up there by Hanover.
SCHMITT Just rolls over the side, doesn't it.
CERNAN Yep.
SCHMITT I don't know what else we can say about it though. Okay we're getting a good view of the North Massif, and the cross hatched lineaments which Gene has talked about are over there also, there seems to be a set that plunge about oh 30 degrees to the east and another set that plunge the same to the west. Plus the boulder tracks which we see occasionally over there and there are areas of boulder fields up on the Massif itself such as we saw on the South Massif. As a matter of fact, it looks like there's one just above where we may - where Station VI may be; straight ahead of us there Geno.
CERNAN Um hum.
SCHMITT About bearing 060 from our present position which is 098 and 4.8.
CERNAN If I change that any the LCRU comes right in on me.
SCHMITT I don't see any - anything like layering up there although the upper of those boulder fields on the North Massif, and as a matter of fact on South Massif -
CERNAN That's Shorty straight ahead of us I think, yeah, that's got to be it.
SCHMITT - all tend to have a linear boundary. That's the upper portion of the field; the lower portion is strung out down slope.
CERNAN That looks like it might be Shorty.
SCHMITT Yeah. We're at 9 - 099 4.7, Bob.
CAPCOM Okay, great, sounds like you're just about there.
SCHMITT Yeah, I think we got it in front of us.
CAPCOM Okay.
SCHMITT Bob, looking at the Sculptured Hills, I think Gene's comment the other day about Bear Mountain would apply. There's a small relief - or small amplitude hummocking this to the surface, it's formed by a cross hatch of let's say the slope I'm looking at is sort of a west-facing slope so on the other side of Wessex Cleft it's formed by lineaments going plunging about 10 degrees to the north and about 10 degrees to the south. The combination gives some hummocks that are quite distinct.

CERNAN Well, you know it's hard to see a blanket, here
but that's got to be Shorty right there.

SCHMITT Okay -

CERNAN It's the only large - real large -

SCHMITT - we want to park, I don't think we'll see
a blanket down -

CERNAN I don't either.

SCHMITT It - well I take - at least we're gonna see
where the break in slope is for the rim.

CERNAN My goodness.

SCHMITT Oh look at the boulders sitting on that rim.

CERNAN It's different.

SCHMITT It is darker.

CERNAN Let's go over there,

SCHMITT No question. We're at 101, 4.5.

CAPCOM Copy that.

CERNAN Okay -

CAPCOM - let us know when you stop and where -

CERNAN - where do we want to park on?

SCHMITT Well, I think we ought to park over here near
that big boulder.

CERNAN Yeah if I can get up to it, I think I can.

SCHMITT You can swing in, you know, and just park
parallel to the, of course, that will put them looking back. Can
you park any direction?

CERNAN Well, yeah but 045 gives me a good - let me -
I'll work on it.

SCHMITT Okay.

CERNAN Let me get up there slowly. I'll put them
on this low saddle here, 045 will give them a good heading.

SCHMITT Shorty is a crater the size of which you know.
It's obviously darker rimmed although the fragment population for
most of the blanket does not seem too different than the light
mantle, but inside -

CERNAN Ooh, ooh, ooh.

SCHMITT Man are you going to get a picture now.

CERNAN Oh yeah.

CAPCOM We can hardly wait.

CERNAN That's about as far as I want to take it.

CAPCOM Okay when you stop and get off, give me
word and I'll read you up some from revised plans for Station 4.

CERNAN Okay, Bob, we're heading 041, bearing is 102,
distance 5.1 and 4.4 on the range. Amp hours are 92 90 102 and
128 on the batteries. Off scale low on the front and off scale
low on the rears.

CAPCOM Copy that. And did I understand 4.2 on the
range, Gene?

CERNAN Yes sir.

CAPCOM Okay copy that.

CERNAN I don't know whether you're wrong or we are but -

CAPCOM Sounds like an interesting crater in any case.

CERNAN This is an impressive one.
SCHMITT Wait until you see the bottom of it.
CAPCOM Okay.
SCHMITT Okay, Houston, Shorty is clearly a darker rimmed crater. The inner wall is quite blocky over - but except for the western portion of it which is less blocky than the others, the floor is hummocky as we thought it was in the photograph. The central peak if you will, or central mound is very blocky and jagged, and the impression I have of the other mounds in the bottom is that they may - they look like swamp masses that may have come off the side.
CAPCOM Okay copy that and -
SCHMITT - that's just what they look like, I'm not sure that - they have - they have a bench appearance.
CAPCOM Okay and the primary priority, number 1 and 2 priorities at this station will be samples from the crater rim and the pan from the crater rim, over.
SCHMITT Okay, we've got a large boulder of very intensely fractured rock, right on the rim, right near the rover. It looks like - it looks like a finely vesicular version of our clinopyroxene gabbro. It's obviously crystalline, and has generally that same appearance. There is in one spot here some inclusions of a darker grey rock also intensely fractured. The fracture systems I think will show up well in the flight line stereo. Bob, do you have TV?
CAPCOM Rog, we have TV and you might brush the lens for us before you run away.
CERNAN Yeah, I'll get it, I've got to get my battery covers cleaned.
SCHMITT Okay, I'm going to take a pan while I'm waiting for you.
CAPCOM And we're going to want the sep opened and dusted as well here so we'll be completely turned off.
SCHMITT Okay, okay. Oh hey.
CERNAN Wait a minute where are the reflections, I've been fooled once.
SCHMITT There is orange soil.
CERNAN Well, don't move it 'till I see it.
SCHMITT It's all over, orange.
CERNAN Don't move it 'till I see it.
SCHMITT I stirred it up with my feet.
CERNAN Hey it is, I can see it from here.
SCHMITT It's orange.
CERNAN Wait a minute, let me put my visor up, it's still orange.
SCHMITT Sure is. Crazy. Orange.
CERNAN I've got to dig a trench, Houston.
CAPCOM Copy that, I guess we'd better work fast.
SCHMITT He's not going out of his wits, it really is.

END OF TAPE

CHALLENGER (two speaking at same time)
CERNAN I guess we'd better work fast.
SCHMITT It really is.
CERNAN About the same color as -
SCHMITT (GARBLE) itself is about 100. (GARBLE) about
102. It's almost the same color as the LMP decal on my camera.
CAPCOM Okay copy that.
CERNAN That is orange, Jack.
SCHMITT Boy this brush is getting harder to get on
and off too, but I sure don't want to lose it. Hey I may start
putting that under my feet.
CERNAN Well, slap me with a little cold water.
SCHMITT Okay the stuff has been dusted. I think I
gave you 102 or something like that.
CERNAN Fantastic sports fans. It's trench time.
Hey, you can see this in your color television I bet you.
SCHMITT I didn't think there would be orange soil
on the moon.
CERNAN Jack, that is really orange. It's been
oxidized - go around and get the lunar sounder over here. It
looks just like a - an oxidized desert soil, that's exactly right.
PAO Total stay time here 30 minutes.
SCHMITT Well, I'm going to clean their glasses so
they don't - so they know where - can you wait a minute on that
pan you're taking?
CERNAN I already took it.
SCHMITT No, I mean the television camera, I'll put
you back where I had you.
CERNAN Now, I'll let you put you right where you
finished your pan. You know - that orange - that orange is along
a line, Geno, along the rim crest - to follow what -
circumferential?
SCHMITT Yeah.
CERNAN Man if there ever was a - I'm not going to
say it. But if there ever was something that looked like a
fumeral eleration this is it. Okay, now let me give you a gra-
vimeter, MARK it.
CAPCOM Okay, mark the gravimeter.
SCHMITT And C is flashing.
CERNAN Oh, never mind, Bob, I'm going to go to
standby. I've got to get my gonomon.
SCHMITT Hey, I think we hit one of those things we've
got to reconsider on, Houston.
CAPCOM Yeah, the problem is we're looking at foot con-
straints right now as luck would have it of course.
CERNAN Mark it, gravimeter.
CAPCOM Roger, copy that.
CERNAN What's wrong with the TV, aren't you watching
it?

APOLLO 17 MISSION COMMENTARY, 12/12/72, 22:21CST, 145:28GET, 579/2

CAPCOM It seems to have died slowly there.
PAO We're having tilt problems with the TV.
CERNAN Well, stand by. Now, I'm going to give you
another stand by and another mark.
CAPCOM Okay.
CERNAN Stand by. On. And mark it.
CAPCOM Copy that.
CERNAN Okay, Bob I've trenched across the trend of
the yellow or the orange. There is light grey material on either
side. Oh, man that's incredible. Say Gene, we're gonna have to
get a down seen color. That's incredible.
CERNAN I'll get my black and white. I'll get it.
SCHMITT GARBLE rock up there that's GARBLE.
CERNAN Yeah, we'll get that.
SCHMITT Okay, let's start sampling that trench. We've
got to get it.
CERNAN Okay.
SCHMITT Look at where the contact between the gray
and the -
CERNAN Yeah, right and it's on both sides and before
you disturb it let me just get a couple of closeups of that.
SCHMITT Hey, can you get a downsun? I think your
color will be best downsun.
CERNAN Okay.
SCHMITT Go to F11. Get a little bit closer, Geno,
if you think you're minimum.
CERNAN I'm out.
SCHMITT Here you go.
CERNAN Let me get one more. Hey you want any of
this bag in the can, Bob? Can in the bag or whatever it is.
CAPCOM Stand by they're debating that right now.
CERNAN Are they?
CAPCOM Roger, let's get the short can in some of that
and -
CERNAN Okay - okay, let us just - let us sample it
first, then we'll get it.
CERNAN It's quite - it's indurated.
SCHMITT Go back and get that one.
CERNAN Go get a new shot.
SCHMITT I'll go get a new shot.
CERNAN Give me that and get a new one. Give me that.
Get some more.
SCHMITT You've got to slow down there.
CERNAN Yep, just take it easy.
SCHMITT I can't see into this.
CERNAN I can't see when your shadow is there.
SCHMITT Can you get around on the other side.
CERNAN Yep.
SCHMITT Cause I can't see the sample.

SCHMITT Oh, well, yeah, that's it. Need to get a sample right across that contact too.
CERNAN I will.
SCHMITT Okay bag that one.
CERNAN Bag 509 has got the orange material from oh about 2 to 3 inches down.
CAPCOM Copy that.
CAPCOM Okay, we're suggesting intermediate for you, Jack.
SCHMITT Okay, the light grey which is on either side we sample the - the - let me get some more - let me have a little more - it's all it is getting mixed with - a little bit with a - about a half a centimeter thick light grey or medium gray covering over the whole area. Bob, the gray material that is adjacent to the red material is at five - how would I say five ten.
CAPCOM Copy that.
CERNAN I had it and I can't see it now. LMP is intermediate.
CAPCOM Copy that.
CERNAN 5 10, Bob -
CAPCOM Copy that.
CERNAN And that orange band is about a meter wide I think - about a meter. You can't get to the end of it - bottom of it though, can you?
SCHMITT I haven't been able to yet. Just to be sure why don't we sample this side of it too.
CERNAN Then I'm going to go get the can.
SCHMITT Okay one.
CERNAN If I can remember where we put it - Bob where did we put the small can?
SCHMITT It's in the - it's in bag 7 under my seat.
CERNAN Okay. That's good.
SCHMITT 511 has the gray from the other side of the orange band and the other side happens to be the crater side.
CERNAN That's right. North side.
CERNAN Okay, why don't you look around a minute and I'll get that can.
SCHMITT Okay, I'm going to see if this goes on down here as a zone. It looks like it's a ellipsoidal area if my foot print is any indication.
CAPCOM 17, Houston, we'd like to get the double core here instead of the small can - double core, please instead of the small can.
CERNAN Okay, did you want it in the orange?
CAPCOM Roger, that's affirm.
CERNAN We can put cores in gray soil all the time.
SCHMITT Well if the vertical stratigraphy do you want to go sideways a little with it? Or you just want to get it as deep as you can, huh?

APOLLO 17 MISSION COMMENTARY, 12/12/72, 22:21CST, 145:28GET, 579/4

CERNAN I expect we want to get GARBLE - let's go as we can on the orange please there, Jac,.

CAPCOM And the one problem at this station Jack is not that we can find a GARBLE station or other station is the fact that we're running up against the walkback constraints here and in just a very few minutes - about two zero minutes.

END OF TAPE

CAPCOM One problem at this station Jack, is not that -
SCHMITT All right.
CAPCOM we (garble) station or any other stations
The fact that we're running up against the walk-back constraints
here and just a very few minutes about 20 minutes.
SCHMITT Okay. Okay, Bob and the bottom will be
44 and the top will be 35.
CAPCOM Copy that.
CAPCOM And after the core, we'd like for you to
go over and sample some of that - some of the big rocks there
on the rim, if you could very quickly. That'll be the
next order of priority after that.
SCHMITT We will, Houston.
CAPCOM And I'm not sure whether your pan will
look down into the crater or not Jack. But if it didn't we'd
like to get another one from there. Hey there's the crater.
SCHMITT It did. (garble) Yeah, look into it
yourself and then I'll also get you a stereo pan before we
leave. I can do that.
CAPCOM Roger. That's some crater.
CERNAN Got your hammer?
SCHMITT Yeah. I (garble) taken stereo pan with
craters, without getting one here.
CERNAN I got mine from right - just right down there,
So, -
SCHMITT Okay.
CERNAN So ah -
SCHMITT I've used that right there.
CERNAN What.
SCHMITT That right there.
CERNAN I don't see it. Oh, it's a piece of
glass probably.
SCHMITT Boy, it sure is.
CERNAN Hey, about right up here.
CERNAN You know that - we were all - we just
about got to the upper edge of this little ellipsoid zone. I think
we're going to have to - we've messed up most of it. Let's
try right over here. I've got a little piece of glass in my
pocket.
SCHMITT Bob, the upper portion of the core is
going to be a little bit disturbed, because, we've walked
around the area so much.
CAPCOM Okay. Copy that.
CERNAN There's a little piece of black glass,
You may want to get up here -
SCHMITT A lot of black glass.
CERNAN Okay, that - did you get a - hold it and
I'll get a shot.

SCHMITT Get your picture.
CERNAN That's about as far as I can shove it in.
CAPCOM Okay. And 17, while you're doing that,
was the grey mantle over the top of this or was it showing
all the way through the surface?
SCHMITT No, it was over the top. It was about
a half a centimeter over the top.
CAPCOM Copy that.
SCHMITT He's getting about 3 centimeters of wax.
CAPCOM Very good.
CERNAN I tell you it's a lot harder going in than
that double core was back there, I guess. Yeah, it's pretty
hard. It acts like it's generally cohesive. It breaks up in
angular fragments.
CAPCOM Copy that.
CERNAN An essential portion of the zone it actually
has a crimson view, or red view. Outside of that it's orange.
And outside of that it's grey. Pardon me Jack.
SCHMITT That's all right, take it easy. I'd
offer to hit him, but I don't think I can my hands are so
tired.
CERNAN I'm going up to MAX here for just a minute
or two.
CAPCOM Copy that.
CERNAN Let me hit some more. Ready?
SCHMITT Yeah, go ahead.
CERNAN Watch it - I'm afraid - Jack, it's
stable enough why don't you get out of the way. I'm afraid
if I leave go of this thing you'll get it in the head.
SCHMITT Okay. Have at it, he's still getting
a centimeter a whack, poor guy.
CERNAN Let's see, I didn't get a locator, I
better get a locator. Oh it's in the, no it isn't.
SCHMITT The only thing I question is our ability
to get it out.
CERNAN Man, that's really hit bottom.
SCHMITT Does it?
CERNAN Yeah.
SCHMITT Okay, do I have core tubes on me now, I
mean caps.
CERNAN Yeah. Caps.
SCHMITT Yes sir.
CERNAN And the rammer.
SCHMITT Yeah.
CERNAN Okay, only - that's all the way down. But I
really - that's it thanks, - I really wonder about getting it
out.
SCHMITT Well, we'll give it the old college try.

SCHMITT Yeah, we ought to be good at getting
cores out by now.

CERNAN It'll come out.

SCHMITT Okay.

CERNAN It wouldn't dare not come out. Wait
a minute. Crab enough to hold on to. Woops. Which side you
got?

SCHMITT I was just getting this out for you.
Let me - I can get this side better.

CERNAN Okay.

SCHMITT Ready.

CERNAN Okay.

SCHMITT Go.

CERNAN Okay, pull slowly. Slowly so I can cap
it all right. Let me get a cap.

SCHMITT Okay.

CERNAN Okay. Hold it - hold - let me get a cap.

SCHMITT All right get the cap.

CERNAN Okay.

SCHMITT Now wait a minute - Are you ready?

CERNAN Okay, very slow.

SCHMITT Even the core tube is red. Look at
that, even the core is red. The bottom one's black, black
and orange and the top one grey and orange.

CERNAN The fact is the bottom of the core is
very black compared to anything we've seen. Hey, we must
have gone through the red soil because it's filled, but
it's filled with a black material.

SCHMITT Let me see, Gene.

CERNAN Dark grey, almost a very very fine grain.

SCHMITT That might be a magnitite. I got it.

CAPCOM Fantastic, fantastic.

SCHMITT Go ahead.

CERNAN Okay.

CERNAN It, it, it, let me -

SCHMITT God, it is black isn't it.

CERNAN Yeah. I've got to get it so I can get
the - Boy, it is black and in contrast to that orange stuff.
Very black. Well not very black. It's a good dark grey. Dark
bluish grey.

SCHMITT Yeah, in contrast.

CERNAN Okay, turn that thing so I can push this
cap a little bit, just turn it -

SCHMITT Which way.

CERNAN Either way. Just turn the whole tube.

SCHMITT Oh, okay.

CERNAN It's just easier to turn the tube than

CERNAN my hand
SCHMITT (Laughter)
CERNAN (Laughter) some more. I don't want
this cap to come off. Okay, I'm going to intermediate
cooling. Okay, now you don't have any caps so let's take
this back to the Rover.
SCHMITT Here's the hole.
CERNAN Why don't you take a picture of the
hole, while you've got a camera there.
SCHMITT Be careful with that.
CERNAN Yeah.
CAPCOM The caps are in SPB 7 there under the
LMP (garble)
SCHMITT Well the hole's mostly - the hole's
mostly in shadows.
CAPCOM And, 17 -
SCHMITT I got them Bob.
CAPCOM 17 for your spot - we'd like - we
have to be leaving here - not like - we have to be leaving
here in 14 minutes on the move because of walk back con-
straints and we'd like to get a quick sample of the Basalt
up there on the rim and Gene's stereo pan and then press on.
And I emphasize that the walk back constraint that we're
up against in 14 minutes - 13 now.
SCHMITT Okay, Bob, I'll get a sample of dust,
I'll sample it by hand. But it'll be documented. Now I'll
get it in a bag in a minute since I don't have any.
CERNAN Come back this way when you do. I need
that rammer again.
SCHMITT Oh, okay, well I better come there first
I guess.
CERNAN Well, I don't need it right this second
but, okay.
CAPCOM Why don't you leave the core there Gene
and then you can take the stereo pan while Jack's getting
that sample and then you can get together and ram the core
hole.
CERNAN Okay.
CERNAN Bob, the bottom of the upper core is
also dark.
CAPCOM Copy that.
CAPCOM Sounds a little thin.
CERNAN And, like you might expect the top of the
bottom core is dark too.
CAPCOM How about that.
SCHMITT (garble)

APOLLO 17 MISSION COMMENTARY 12/12/72 CST 22:30 GET 145:37 MC-580/5

CERNAN If I ever saw a classic alteration halo around a volcanic crater, this is it. It's ellipsoidal. It appears to be zoned. There's one sample we didn't get. We didn't get the more yellowy stuff, we got the center portion -

CERNAN Let me get those caps, Jack. What - That's what's holding it. Holding it from coming out. Get you a bag.

SCHMITT Okay.

CERNAN Okay, the -

SCHMITT I got it.

CERNAN The basalt is in bag 512.

CAPCOM Copy that.

END OF TAPE

CERNAN Am I getting in your bag here? Gene?
 CERNAN Got it. Okay.
 CERNAN Jack, our lock is on the outside here, so we better watch this gauge.
 SCHMITT Could happen.
 CERNAN Not going to worry about it. This lock is on the outside of that lever lock going up there. You'll see what I mean when you look at the lock. Okay, I'm going to get my pan.
 SCHMITT Okay.
 CERNAN As long as they're not rammed yet. You want to ram them while you're here? What did you do with my extension handle?
 SCHMITT Oh, it's here.
 CERNAN And if you want to ram them -
 SCHMITT Okay.
 CERNAN - there you are. They're not rammed.
 SCHMITT I'll get them.
 CERNAN Okay, Bob, I'm going several meters around to the east and towards the south to get this pan.
 CAPCOM Copy that.
 CERNAN I'm going upslope. On cirqua - on cirqua, you know, on the rim. And I'm up. Oh, that ought to be a beautiful shot, if I could see what my settings are.
 SCHMITT Okay, the lower core is chucky jam full. I don't think I've budgeted that thing.
 CAPCOM Okay, copy that.
 CAPCOM Okay, and Jack, I copied, aside from 3 trunnion angles, I copied one single rock - one single bag of basalt samples, is that correct?
 SCHMITT That's right. 512.
 CAPCOM Copy that.
 CERNAN Hey, Bob, from where I am, about 100 meters around the (garbled) side of the rim of this crater, the mantle on the inside of the rim, turns from this grey material that we've been sampling the sampling in here to a very dark grey material. And there's a lot of orange stuff that goes down - radially down into the pitted crater.
 CAPCOM Okay, copy that. How's the panning?
 SCHMITT Hey, Bob, those cores didn't feel like they - follower went down at all.
 CAPCOM Okay.
 SCHMITT Shouldn't it have gone a little bit?
 CAPCOM Not necessarily if it's pretty compact stuff. You were having a hard time getting it in.
 SCHMITT Well, I thought there was a little space up there, but maybe I just didn't feel it.
 CAPCOM Not very much, ah -
 SCHMITT I don't think there's much danger of them coming apart.
 CAPCOM Okay, great.

CERNAN I got just a couple of more pictures at that contact slope over there. I know you can't see it from where you are, Jack, but I guess we gotta leave, otherwise it would be nice to sample that dark stuff up on top.

CAPCOM We need you guys rolling in 7 minutes.

CERNAN We can get a spool - oh, I bet I'm out of film. Well, I got them all anyway, Bob, I'm at 162. I'm out of film. That stuff and you're looking at me with the camera. That stuff is up toward that boulder, around that - about as far away from that boulder on the other side as we are on this side. And we're going to hack at that boulder too. Jack, let's see if we can't get that boulder, anyway.

CAPCOM Ah -

CERNAN But I don't have any film.

CAPCOM Guys, we don't have that much time.

CERNAN I know, Bob, I know. There's a lot of little pieces, not a lot, but enough that I've seen five or six of them. Little pieces of obsidian-like glass. I got one in my pocket. Unbagged. Undocumented.

CERNAN This boulder that you were looking at with the TV, I'm going to take a sample, undocumented.

SCHMITT I got it, I got it.

CERNAN Oh, you got it?

SCHMITT Yeah.

CAPCOM Yeah.

SCHMITT Let's go.

CERNAN I'm sorry, I didn't know you got that.

CERNAN Bag 461 has another sample of the - of basalt that I picked up right near where we dug the trench.

CAPCOM Copy 561.

CERNAN Okay, Bob, I'm going to give you something with the - I'm going to give you something with the TV I want to show you where that dark material starts.

SCHMITT Hold still.

CERNAN Measure, okay. As you look at the inner rim as it goes down to the right you see a lot of boulders, a lot of rocks that are protruding out. Where that rock pattern thins out, just beyond that is an orange - a visible orange radial pattern, and then beyond that is a definite change in albedo where you get the grey material, and a definite change in the number of rocks on the slope.

CAPCOM Gene, roger.

CERNAN That particular -

CAPCOM Copy that.

CERNAN - material can - and that particular material. Let me finish, Bob. That particular rim material there continues around to the due north and then there's a drastic change again where you see the - the inner rim completely tainted with this boulder film.

CAPCOM Okay, copy that, Gene, and you can talk about it when you get home.

CERNAN And I can't bet on it, but I can see it.
Okay, roger, happy I am.
SCHMITT Wait, Gene. Wait, wait, wait.
CERNAN I gotta get the film changed, Jack.
CAPCOM All right, Gene, change the film at the next
station, we could save time that way.
CERNAN All right.
CAPCOM And we would like the SEP turned on before you
leave -
CERNAN We did that.
CAPCOM - and we'd like EP number 1 taken, Jack, deep
in the (garble) Victory.
SCHMITT Okay. I'll get your scoop for you. Do you
believe in a cock like that?
CERNAN Yes. Of course, we haven't been taking any
SEP measurements, I don't know what difference it makes.
SCHMITT Okay, everything is locked on.
CERNAN I can tell you're reading, Bob.
CAPCOM We're reading loud and -
CERNAN It's 70012501 670012501.
CAPCOM Okay, we copy that, Geno, and -
CERNAN Okay, got the -
CAPCOM - charge number 1 and and we need a SEP on it.
SCHMITT We got the we got the rake.
CERNAN Step on, Jack, I'll get charge number 1.
SCHMITT Okay. I'll get the SEP on.
CERNAN I'll just hand it to you.
CAPCOM And what's your frame, Gene - Jack.
SCHMITT Okay, bar's on, recorder is on, the temperature
is 112.
CAPCOM I copy that.
SCHMITT Can you get it, Geno?
CERNAN Yeah.
CERNAN You get in and I'll hand it to you.
SCHMITT Okay.
CERNAN And now I'm going to get the TV.
CAPCOM And Jack, what's your frame count, please?
SCHMITT Wait, Bob, I can give you that on the Rover.
CAPCOM Okay. I thought you were on it.
CERNAN Okay, camera's going aft, camera's going aft.
Well, I guess that's the breaks of life. Low gain on SEP when
I get on, I'll give you - this - when you're ready. First thing
I got to do, Bob, is change film at the next station.
CAPCOM That's affirm.
SCHMITT And Bob, LMP is at 75.
CAPCOM Say again, there Jack, I missed that.
SCHMITT 75.

APOLLO 17 MISSION COMMENTARY 12/12/72 22:39 CST 145:47 GET MC-581/4

CAPCOM Copy that, thank you.
SCHMITT I must be getting fatter, you know it.
CERNAN Fatter?
SCHMITT Well -
CERNAN Depends on how you get in.
SCHMITT What - how about a hammer?
CERNAN Okay, we got a flag on the Rover.
SCHMITT Your hammer's caught again. That's all right.
CERNAN We got a flag on the Rover, and I'm reading

136 on battery number 2.

CAPCOM Say again on that one, Gene.
CERNAN I'm reading 136 - make that 132 on battery
number 2 and we did get a flag.
CAPCOM Copy that.
CERNAN Okay, Jack, I'm going to make a very sharp
right turn here, 'cause I do not want to go down that hill.

END OF TAPE

CERNAN Okay, we're moving Houston.
CAPCOM Roger, you're moving exactly 37 seconds on surely.
SCHMITT I could have gotten that dark mantle on the
other side of that crater. That's all it took me.
SCHMITT So you saw radio orange, huh?
CERNAN Yeah, it was radio, Jack, you could see it -
it'll be in the pictures.
SCHMITT Oh, man I can't crowd it into that heading.
Let me get my -
CERNAN That was on the inside of the crater?
SCHMITT On the inside rim of the crater.
CERNAN Yeah that's where the surface dust keeps
slumping off - it was exposed probably.
CAPCOM (GARBLE) station, men, we thought that 2 (GARBLE).
SCHMITT Get my (GARBLE) in (GARBLE).
SCHMITT Okay, I'm Min. Man I'll tell you that heading
is going to put us right.
CERNAN Okay, Bob give me a - dang, wait a minute.
CAPCOM For heading you should be generally taking
toward 090, Gene.
CERNAN Where were you at?
CERNAN Okay, can you give me a bearing in range at
victory.
CAPCOM Okay stand by.
SCHMITT Did you get the DGE read?
CERNAN Yeah, I did - I got it read. They got every-
thing that station but not everything I'd like to give them.
CAPCOM Okay, it's going to be 105 and 3.1.
CERNAN Okay.
SCHMITT Man, I tell you that LCRU was terrible, wasn't
it.
CERNAN GARBLE than any. Well, you can always zigzag.
SCHMITT Yeah, that's what I've got to do. I've got
to tack into that sun.
PAO Station 5 is at the crater Camelot.
CERNAN Camelot, hey Joe I didn't have time to really
think at that station but that could - I think based on heavy
(GARBLE) - If I hadn't seen that alteration and all I'd seen is the
is the - fractured block on a rim I might have - which looked like
this stuff in the bottom - I might have said it was just another
impact. But having all the color changes and everything I think
we might have to consider that it could be a volcanic vent.
CAPCOM Roger, it surely was different anyway.
CERNAN I'm not sure how we prove it. We didn't have
time to prove it.
CAPCOM We noticed. I guess that's the breaks of
the game sometime.
CERNAN Hey Bob, I forgot your number at Victory. How
about giving them to me again.

APOLLO 17 MISSION COMMENTARY, 12/12/72, 2:49CST, 145:56GET, 582/2

CAPCOM Okay, 105 3.1. And I'll be heading a 090 is the general reading in that direction.

CERNAN Okay 105 3.1.

CAPCOM I guess we always have station 9 to look forward to guys, that may be the same thing - we'll probably be out of time when we get to that one too.

PAO A six pound explosive charge will be deployed near Victory on the way to Camelot and station 5. This is the largest of the charges for the lunar seismic profiling experiment.

CERNAN Hey, Bob I note on those radiators I have been dusting the covers at every stop, whether that's any help or not.

CAPCOM Okay, we copy that.

CERNAN Okay, sports fans. We're still about on the - well I think we moved - yeah, we moved out into the Tortilla Flat area again. Not very flat.

CAPCOM That's affirmative.

CERNAN Loop can not go through - I can see them coming. 102 3.8 and where's Victory?

SCHMITT Dead ahead.

CERNAN Boy, Victory is going to be subtle I'll tell you. Bob, how long we been out?

CAPCOM Stand by.

CAPCOM 5 plus 26. 5 plus 26.

CERNAN Hey - hey, Bob I recommend that if we ever do this again let me get off and take the charge off when we want to deploy it. It really adds to the fatigue of the hands.

SCHMITT Think you could just hook it on to your fingers?

CAPCOM We copy that, Jack. And Charlie's got a big smile on his face here.

SCHMITT Mark my words. There's Victory over there, I bet. See that's the long end.

CERNAN Yeah, yeah.

SCHMITT I can't see over there, but -

CERNAN Okay -

SCHMITT Got too much sun in my eyes.

CERNAN That's the right way to go.

SCHMITT That'll be about it too.

PAO Charlie is Charlie Duke the backup LMP.

SCHMITT Boy that's a big rock in front of you.

CERNAN I got it.

SCHMITT Okay. Well, you can't tell much about the countryside going into the Sun, can you?

CERNAN Put your upper visor down. That'll give you a whole different perspective.

SCHMITT It doesn't vise very well. It's stuck.

CERNAN That's got to be Victory over there, Jack.

SCHMITT Yeah.

CERNAN We're at 103 3.4.
CAPCOM Copy that.
CERNAN That is Victory. We're still seeing the
bit bottom glass - the glass lined bit bottomed craters. How's
that?
CAPCOM Otherwise known as the GLBBC.
CERNAN GARBLE. Took you a while didn't it.
CAPCOM It's 11 o'clock down here, guys.
CERNAN It's 11 o'clock up here, too Bob. There's a
square boulder - look at that one.
SCHMITT Yeah, it's square all right - or at least one
side of it is.
CERNAN No, three sides of it are square. Just frac-
tured that way - it's by accident from looking at it. So how do
we get over here?
SCHMITT Go left, probably. Along the rim.
CERNAN Yeah, that's where I'm going to go. Hold on.
SCHMITT If Charlie is smiling because my hands are
tired why did he let you have me get the charge off? Fine backup
crew we've got.
CAPCOM You guys didn't really mean to say that did
you?
CERNAN 106 3.2 we're approaching the rim of Victory.
And the LMP frame count is somewhere around 7 - well 8.5, maybe.
SCHMITT That's Victory, look at it go to the left
and look at it go to the right. That's Victory we're right on
the ridge.
CAPCOM Yep. Okay and we're picking GARBLE you guys
CERNAN We're at 106 3.
CAPCOM Copy that.
CERNAN 106 3.2.
CERNAN Okay, let's see.
SCHMITT Tell me where you want that thing and we'll
get a pan around it.
CERNAN Okay, let's - I tell you what - you see right
ahead of you -
SCHMITT Yep, it's - looks like a place you could
spin a profile on.
CERNAN Yeah, I could do it right up in here.
SCHMITT And deploy the charge. Tell me where you're
going.
CERNAN I'm going right. Here you could put it in
that hole. No you don't want to do that.
SCHMITT Just pick a spot and take your photos.
CERNAN Okay, I've got them.
SCHMITT Now, go just beyond there. Little bit more.
That's good.
CERNAN Okay.
CERNAN Okay, Bob we're at 106 3.2.
CAPCOM Copy that.

APOLLO 17 MISSION COMMENTARY, 12/12/72, 22:49CST, 145:56GET, 582/4

CERNAN Okay, pin one is pulled and safe. Pin 2 is
pulled and safe and -
SCHMITT Boy, these are stiff this time around. Push
it in - try again.
CERNAN That's a big black box don't pull it too hard.
SCHMITT Stand by on pan 3 gang.
CAPCOM Remember to push it all the way back in Jack
and start from scratch.
SCHMITT I did - I did - I did. I remembered - I
remembered.
CAPCOM Good.

END OF TAPE

CERNAN I did, I did, I did, I remembered,
I remembered.
CAPCOM Good, good, good.
CERNAN But now I can't get to it.
SCHMITT Here hand it to me let me try it once.
CERNAN No, it's not that, it's just - it's
coming. Got it. 10 3's out and safe.
CAPCOM Copy that.
CERNAN And look at the orange flag. Golly.
CAPCOM That's what you guys were sampling at
Station 4, I bet.
CERNAN Huh? Yeah, it's about that orange or
a little - not quite as bright. Same - same shade.
PAO The crew's about 12 minutes behind the
EVA timeline.
SCHMITT Get that out a little more.
CERNAN Bob there's no question but what that
were at Victory.
CAPCOM Say again there 17.
CERNAN It's the first crater that looked like
I thought it would.
CAPCOM Okay.
CERNAN Okay.
SCHMITT You ready?
CERNAN Let me change my setting here.
SCHMITT Okay.
CERNAN Okay, let's get a nice Rover pan here.
SCHMITT Okay, turn the other way first.
CERNAN Yeah.
CAPCOM Take her slow and, we'll get a Rover sample here,
before you guys leave too, after the circular pan.
CERNAN We will.
SCHMITT Auto.
CERNAN Yeah.
CERNAN Look at the white mantle over there.
SCHMITT You can sure see it now, can't you though.
CERNAN You just thought (garble).
SCHMITT I got it yeah.
CERNAN Okay, okay. Let's get our Rover sample.
SCHMITT Okay.
CERNAN And the Rover sample will be from the
same locality. Boy it's just a couple of meters from the
charge isn't it.
SCHMITT Yea.
CERNAN I hope I didn't put too much soil in
there for you. Wait a minute. Okay. Rover sample works
just as advertised.

CAPCOM Copy that.
CERNAN Not bad.
SCHMITT That's bag 43 yankee.
CAPCOM Copy 43 yankee. And how about a frame
count after - right now, Gene - Jack.
SCHMITT I will. Stand by. You're jumping the
gun occasionally but not very often. 106.
CAPCOM Copy 106.
CERNAN Good going, Jac.,.
SCHMITT Okay.
SCHMITT Okay. I guess we're ready to leave here.
Huh.
CERNAN Well, if they don't want us to stop
here, I guess we leave.
CAPCOM Roger we're ready for you guys to leave
there -
SCHMITT There's nothing else here now.
CAPCOM And we're pressing on towards Station 5.
CERNAN Okay ah -
SCHMITT Gene.
CERNAN Okay, and I want to go about 120.
SCHMITT Okay.
CERNAN Can you see out there and give me one
look down east - north into Victory?
SCHMITT Yeah, I can do that, we - I - we've got
to go by there any way.
CERNAN North. I'll just swing point north so
I can look in there.
SCHMITT Okay.
CERNAN I never got a good look in there.
SCHMITT Well, it's a series of three craters.
There's some boulders on the Taylor slope of the eastern most -
eastern most - of the west - eastern slope of the southern most
crater, the one we're closest to.
CERNAN Now how does that look to you?
SCHMITT Well it looks like - and see there's the other -
I don't know what it looks like. The northwest end of the
V has a white blotch - white blotch on it boulders on the other
inner wall and right at the rim. And the northeast end of the V
looks like it has somewhat darker rocks -
CERNAN Yeah
SCHMITT Part of that is shadowed, but I think
they are darker. And they look like about the same as down here
near the tip of the V on this -
CERNAN Let me clarify that one, because there's
one sloping a way, one sloping towards us.
SCHMITT Yeah I know. I qualified it.

CERNAN Okay, we are rolling by the way. And we're at 106 and - well yeah we're still 3.1.

CAPCOM Yeah. Copy that. Thank you.

CERNAN In the rim itself though, Victory is not blocky. There a little - there's some increase in fragment size but that seems to be the result of some craters in the rim that have gotten below the debris that's covering it. I'd say that Victory's somewhat like Horatio in that it has has blocky inner walls but, has essentially a normal block population on the rim.

CAPCOM Okay, and we've got a Rover sample going toward Station 5 at about 103 and 2.5.

SCHMITT Okay. 103 and 2.5

CAPCOM Roger. And that'll be just a grid sample.

SPEAKER They're - none of them are just grid samples, Bob.
(laughter)

SCHMITT You see you can't tell how deep they are until you get up to them.

CERNAN Yeah.

SCHMITT That one there I could have gone through.

CERNAN Yah.

SCHMITT Okay, Station 5 is Camelot. Good old Camelot. (Humming)

CERNAN Look at the size of that one. That's another one of those -

SCHMITT Yep.

CERNAN Some of them - there's another one on the right. Look it.

SCHMITT Some of them have - well that one doesn't have any fragments in the bottom of it -

CERNAN No

SCHMITT Looks like someone walked across it.

CERNAN Yeah. I think that there's quite a variability in the thickness of the dark mantle in here. Did you - I didn't notice (garble) the stropping in that one terminal light mantle.

SCHMITT No, I didn't either. Obviously we did

CERNAN I think we did.

SCHMITT Right at Victory, but it didn't show up.

CERNAN Looking into the sun, you can't tell any difference anyway.

SCHMITT However, I tell you, I certainly get the impression there is a mantle. I would say that -

CERNAN Oh, I think so. I don't know what it is but the dark mantle exists. There just - the craters - these craters are just too big not to have thrown up blocks. And their either subdued by the mantle or they haven't penetrated it.

SCHMITT And in these blocks you probably have both. Excuse me Gene (garble).

SCHMITT I'd say they've been subdued by the mantel. That - that really imposes an impression on me.

CERNAN Yeah there are those that appear that way, like Horatio, for example on the big ones. But others I think are too young. And they just don't penetrate. Particularly those that are big and have bright halos.

SCHMITT But the only ones that look fresh and not enough to penetrate are these little ones with the glass in them.

CERNAN Well, there's been some big fresh ones. We'll look for one.

SCHMITT Now there's one with glass in it probably.

CERNAN Yeah, I think that one - that's one - -

SCHMITT And without any blocks on it. That - that may not have penetrated.

CERNAN Yeah. Yeah, that just has the, mostly the shock indurated rock. Injured rock.

SCHMITT We're coming up to 103 and 2.6 now, so we need a sample up here.

CERNAN Okay.

SCHMITT Okay. 103 2.5 anywhere.

CAPCOM Roger. That's affirm.

CERNAN Okay, let me ah - good. Let me slowly go to the right here.

SCHMITT Okay. Right out in that little inner crater area right out in there is good. If you let me guide you a little I might get a rock sample. Whoa, whoa, whoa. That's it.

CERNAN Okay.

SCHMITT That's quite enough.

CERNAN Okay. Pick a point.

SCHMITT Move ahead - Move ahead about no right, no that's good. Straight ahead, straight ahead. Good, good, good, good, whoa. Now we'll give it a try.

CERNAN Okay, 103 2.5.

CAPCOM Copy that.

CERNAN And that battery is still at about 132.

CAPCOM Okay. Copy that.

CAPCOM We're allowed to go to 120 tonight.

SCHMITT I don't expect we'll make it. I think we'll get done before that.

CERNAN Save that for tomorrow. I'll tell you those batteries deserve any temperature they want today.

After - going up that-

SCHMITT That's the soil.

END OF TAPE

CERNAN I tell you those batteries deserve any temperature they want today after going up that -
SCHMITT That's the soil.
CERNAN That's Scarp.
SCHMITT Okay, the soil is at 44 Yankee.
CAPCOM Copy, 44 Yankee.
SCHMITT That rocks too big, I can't get it -
too big.
CERNAN Okay, get your picture?
SCHMITT No. Okay, got mine.
CERNAN Okay, what's the - well we find on Camelot.
SCHMITT And the 125, the LMP frame.
CAPCOM Copy that. And just press on the same heading you've been carrying there, Gene, and that will get you to Camelot.
CERNAN We want the southwestern edge, huh.
SCHMITT Do you want to go where station 5 is,
Bob?
CAPCOM That's my understanding, Jack so press on toward there unless I tell you otherwise.
SCHMITT Yeah, but you were talking about changing station 5. I think station 5 is a pretty good spot.
CAPCOM Roger, and I think that's where we want to go - I just want to verify that - you can go in that direction though. I'll get with you if it's not.
SCHMITT Okay. It's probably the most concentrated boulder field on Camelot.
CAPCOM Okay, you know where it is, and we think it's on 092 and 1.6.
SCHMITT 092 and 1.6 -
CAPCOM Roger. But you know where it is so you'll find it when you get there.
SCHMITT (garble) It's different.
CERNAN Wonder where Horatio is?
CERNAN We're going to run into something in a minute if it's - it's probably right over that rim on the right, Jack, right off your right hand.
SCHMITT Right you are.
CERNAN I guess so - you know it doesn't have boulders on it.
SCHMITT It should be over there.
CERNAN That should be it right over that rim. You know I see why Al and Ed had trouble walking up Cone Crater, you could stand right on the edge of the rim of a crater and not know it was there.
SCHMITT Yes.
CERNAN Man, that was spectacular - color on the Moon - it's really orange. Can you see that color on the television?

SCHMITT No answer.
CERNAN I bet they couldn't.
CAPCOM No, we couldn't see it, Gene. (garble)
CERNAN Okay, I'm sure glad I went up and took that second pan to see that stuff go radially down into the center of the crater at that contact.
SCHMITT Yes, that's good.
CERNAN Hope it comes out.
SCHMITT Doesn't make any difference, it's there. comes out or not.
SCHMITT Okay, look at that up the cleft up there, you can see definite change in albedo now between the North Massif and the Sculptured Hills, look it, right up this valley. You can't see it - let me -
SCHMITT You're right.
CERNAN You got to see this. See that.
SCHMITT Yes.
CERNAN But again, that may be your photometric effects.
CERNAN Yes, ones an upslope and ones a downslope.
CERNAN Just about right, but it's supposed to be darker in the cleft, you know.
SCHMITT (garble) LMP back to minimum.
CAPCOM Roger, thank you.
CERNAN Oh, whoop, whoop, whoop. I wish I had a movie picture of us driving.
SCHMITT You're doing the driving. (garble)
Classic of the century. You're doing -
CERNAN Well, there must be somebody out there.
SCHMITT Bob, the fragment population - we're at 0992.0 is still about the 1 percent category, and it's hard to tell, going into the Sun, what kind of blocks you're dealing with, but my guess is that most - well, it's more than a guess, most of them look like they're slightly vesicular, and in that regard, resemble the gabbros.
CAPCOM Okay, copy that.
SCHMITT (garble) there are -there is something - there's a class of boulder that is black topped and very well rounded that is just about completely buried. Only not more than 5 centimeters of it projects above the surface. We've seen those off and on both days, remember Geno?
CERNAN Yes.
SCHMITT And they seem to be quite distinct. At least you notice them, now, whether it's just a continuation of the mantling, I don't know, but most other boulders - the big ones seem to be - project above the surface more than just that 5 or 10 centimeters.
CERNAN I tell you, the sculptured hills just have that wrinkled old face feeling.

SCHMITT Yes. There are blocks over there though, aren't there?
CERNAN There's blocks, but I don't see any concentrated outcrop or concentrated masses of blocks up there on the slopes anywhere, like (garble) massif.
SCHMITT Possibly due -
CERNAN Do you think that's Camelot or not?
SCHMITT I think that might be Camelot.
CERNAN Look at that.
SCHMITT Nice shot.
CERNAN Look at that, right on -
SCHMITT Now, wait a minute -
CERNAN Southwestern rim -
SCHMITT Yes, yes.
CERNAN Horatio's got to be on our right. Now, wait a minute, doggone it.
SCHMITT It's not Horatio is it?
CERNAN We're at 0941.7.
CAPCOM Stand by.
SCHMITT I think that's Camelot, Horatio didn't have blocks that far up the rim.
CERNAN Yes, let me look at the bottom, I'll tell you, I remember.
SCHMITT Yes. Back down - down at 5 (garble) these blocks -
CERNAN Yes, I remember. Yes, this is it, Bob, we're coming right up to station 5, right at it.
CAPCOM Right at it.
SCHMITT Only way to fly.
SCHMITT Okay, you want to park up on the rim so they can have a good panorama?
CERNAN Sure, I'd like to get a little on the other side of those blocks if I can.
SCHMITT Yes, you better, then they can look with the sun on them.
CERNAN Yes, cause otherwise they can't see that other rim over there.
PAO We've said goodnight to Ron Evans.
CERNAN Yes, I'll get to the other side, then they can look at these blocks across the way. I got to go around this block field, though.
SCHMITT I should hope so. (garble)
CERNAN There's Horatio back there. I see Horatio now, okay.
SCHMITT Looks just like it did before.
CERNAN We came right where we were supposed to.
SCHMITT All the blocks look very much the same in the wall of Horatio.
CERNAN There's a path through -

SCHMITT Watch it, watch it.
CERNAN Okay. Well, that's a test.
SCHMITT That was a good one.
CERNAN That was a good test. Didn't let any
air out of that tire did it?
SCHMITT I don't think so.
CERNAN Talk about a block field.
PAO America in its 30 revolution, coming up
in the vicinity of the landing site, now.
SCHMITT Geno, where are you going to park, right
over there?
CERNAN I'll park right over here so that they
can look in it.
SCHMITT Okay.
CERNAN I had 045 so I headed right into those
blocks.
SCHMITT Oh, you still got to turn remember.
CERNAN Yes, that's why I want to leave myself
a little room over there.
SCHMITT Oh.
CERNAN Okay, Bob. We're stopped 086 and 1.4.
CAPCOM Okay.
SCHMITT That's pretty level for the gravimeter.
What's there limit?
CERNAN I don't know, but it's taken a couple
better than this.
SCHMITT Now, I got to change film.
PAO We're at 5 hours 50 minutes. We want to
leave station 5 at 6 hours 15 minutes.
CAPCOM We're talking about that now - you've
got. Stand by. You've got about 25 minutes at this station, guys.
We've given you somewhat of an extension here. You're using
up some of it back at the LM, but we've given you somewhat
of an extension, you've got 25 minutes at this station. The
primary priority will be sub-floor documented samples, and
sub-floor rake-soil, as you can imagine.
SCHMITT Okay.
CAPCOM We'd also like to open the SEP and again
check the cool.

END OF TAPE

SCHMITT Okay, hoss.
CAPCOM We'd also like to open the sep again
to check the cool -
CAPCOM We'd also like to open the SEP again
to check the cool.
CERNAN Okay.
CERNAN You want me to turn it off.
CAPCOM That's affirmed. Turn it off, open it
up, the same thing we've been doing to it all aft - all
evening.
CERNAN Turn it off.
SCHMITT Say, it's mid day here, Bob.
CERNAN Leave it open and I'll dust it, Jack.
SCHMITT Okay.
SCHMITT Oh, the temperature - they'd like to know.
CERNAN Temperature is still about a hundred twelve.
CAPCOM Copy that.
SCHMITT You know, the thing I - you know, the thing
I dread most?
SCHMITT About close out.
CERNAN What's that?
SCHMITT It's dusting you.
CERNAN Yeah, I'm not going to be able to do
much today, I don't think.
SCHMITT We don't have nearly as much dust on
because yesterday we were wallowing around in it. Today,
we're -
CERNAN Who? Me!
CAPCOM Okay and Gene, if you're not off the
rover, how about the rest of the rover readout?
SCHMITT Okay.
CERNAN Okay, Bob, I'm off but I'll get them
for you. I'm sorry.
SCHMITT I look at them and they all look good to
me. And it - you know I keep forgetting to give them to you.
CERNAN Bob, I have 135 frames. I think I can
finish the station, don't you?
CAPCOM Yes, probably.
CERNAN You know that step didn't get much -
well, it's getting a little on it, but those mirrors don't
clean off as nice as the - as the LCRU mirrors.
SCHMITT Okay Bob, it looks just like our old friend,
the clino pyroxene gabbro with the shiny luminite platelets in

SCHMITT the vugs and partially recrystallized vesicles. The textile variations are plainer and they're primarily sub layer in the concentrations of vesicles.

CERNAN Jack, I'm going to put this brush under my - my seat. It just gets to hard to get off that place up there.

SCHMITT Okay.

CERNAN Bob, what magazine?

CAPCOM Magazine Delta.

SCHMITT Watch yourself through here, Gene-o.

CERNAN Yeah.

CERNAN Delta's, huh?

CAPCOM That's affirmed.

CERNAN Delta, Bravo. There's Delta.

SCHMITT Boy, this is certainly a year of the sub floor. As we mapped it, it's certainly a uniform - uniform rock type, I'll tell you. The only variations are those gray dunes which are - which just seem to be either finer or the absence of vesicles. Boy, I'm nose to nose with a piece of it right now. Say Bob, where can I get a new set of bags?

CAPCOM Okay, you want - the new bags they'll be under Jack's seat.

SCHMITT There's some under my seat. There's some, Geno.

CERNAN Okay.

CERNAN Just loose.

SCHMITT Yeah.

SCHMITT Here I am, folks in the middle of a boulder field, just minding my own business.

SCHMITT I don't know if I mentioned it. The texture - mineral texture is - appears to be sub-othetic to - sort of like - like a good diobase although a little coarser. But it's unquestionably organized and with that variation in vesicle concentration.

CERNAN Delta now frame 4, Bob.

CAPCOM Copy that, Gene.

CERNAN Jack, I've got to get new bags. I've only got one left and you don't have any, I don't believe.

SCHMITT I don't have any.

SCHMITT Bob, there - I have the impression that these blocks are buried up here, that the mantle does exist, even on Camelot. There are a few blocks that are

SCHMITT lying out on the - looks like they're lying more less on the surface but you might - you can attribute those to - to craters that have disrupted the block field.

CAPCOM Okay, good observation.

SCHMITT The big ones seem to be projecting out of the - the big ones seem to be projecting out of the mantle.

CAPCOM Okay. Do you see any such mantle on -

SCHMITT Although, I can't see how the mantle in here could -

CAPCOM On top of them.

SCHMITT It's not as - No, I don't. What's there seems to be what could have been knocked up there.

CAPCOM Okay, I understand.

SCHMITT I see a place where - I see a place where I think we can skim some off the top of a rock, which I think we ought to do.

CAPCOM Okay.

SCHMITT But I don't have the impression of draping so much as I have just of burial and I have a feeling that the - this zap pitting process just to clean these boulders off of anything that might have been on top of them. In excess of what's around them right now.

CAPCOM Okay, you're talking about -

SCHMITT Also, like Horatio the - go ahead.

CAPCOM You talking about mantle blocks then mantle and then clean off by zap pits, in other words.

SCHMITT That's right.

SCHMITT Most of the rocks seem - that seems to be what has happened all over the Moon that we've looked at. But the rocks are always cleaner than the - than the surface, of course. The far rim of Camelot - you can see - fact is everywhere but where we are and on the rim near the LM, the - there seems - the rim seems to be completely covered or at least the blocks don't show through. They show up in the wall but not in the rim. That's much like Horatio but not to the extreme that we thought Horatio. I'd say, at Camelot, the mantle is - oh maybe - at the most - the rim thickness at that mantle is on the order of a half of what we saw at Horatio.

CAPCOM Okay, copy that.

SCHMITT The pan should let you measure that - we'll we didn't get a pan at Horatio but we got some rover

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SCHMITT shots of it but you may be able to come quantify that a little bit.

CAPCOM Okay.

SCHMITT I covered, Gene-o.

CERNAN Oh, I've got new bags. I've got new mags. I've got everything cleaned up and mark gravimeter.

CAPCOM Copy, mark that.

SCHMITT Here's a nicely structured rock that we probably ought to work on here. Structured again in the vesicle concentration and then I think we ought to try to get - right over there we can get mantle.

CERNAN Hey, I'll tell you what impresses me about some of these rocks. There's a lot of - they may be zap pits - I guess you looked at them closer than I did but there sure is a lot of - lot of lineation in some of that white - white material, Jack.

SCHMITT What scale?

CERNAN Well, on a - on a - on a visual obvious scale.

SCHMITT Well I mean the - Okay.

CERNAN I'll show you. If you don't - let me see if it's up here.

SCHMITT The crystal grains are - seem to be linear but they are more or less random. Is that what you mean?

CERNAN No, they're linear though.

SCHMITT Yeah.

CERNAN Can't be - can't be really linear and random. There's some rocks here that are - that are highly vesicular and there's others that are not.

SCHMITT That's right.

CAPCOM Okay, and a reminder 17. You guys have the primary priority of the blocks and then a rake soil of the - of the white sub-floor soil there and you've only got 15 minutes before we want you driving back to the LM. OVER.

SCHMITT Gene, if this is what you mean, it's -

CERNAN Okay, we'll get to work.

CAPCOM Okay.

SCHMITT Let's sample this.

CERNAN Okay.

SCHMITT Let me get these two first and then we'll go get that one.

END OF TAPE

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CERNAN Okay, we'll get to work. Okay that sample -
SCHMITT Okay, let me get these two first and then
we'll go get that one, because there's two different kinds here -
at least apparent kinds. With a relatively new fracture. Boy I tell you
watch when you back up.
SCHMITT Yeah, that's what I told you.
SCHMITT I've already cycled film.
CERNAN We need to sample the structures though in
this thing. We haven't really done that.
CERNAN We'll try to get an around the corner picture.
SCHMITT And we've got to get - we need to get that
stuff on the mantle too. I mean on the block.
CERNAN Okay, we want to get around the corner. Get
a picture of one of those big ones too and see if we can get the
structure of it. Okay, you got your picture?
SCHMITT Yep.
CERNAN Here's a piece right here.
SCHMITT Okay, can you hand me a bag or I'll pick it
up with a scoop, whichever you prefer.
CERNAN Get the bag. Let's see if we can fit your
bag thing tonight.
SCHMITT Okay, I got it.
CERNAN Okay, that looks like our old friend the
gabbro all right. That fur piece.
SCHMITT 462 is Gene's very freshly fractured rock.
CERNAN Did you put it in the bag?
CERNAN Okay, here's another one right here.
SCHMITT That one.
CERNAN Yeah.
CERNAN Why can't you squeeze this these things
anymore, here you go.
SCHMITT Get a bag.
CERNAN Not yet.
CERNAN Okay. GARBLE.
CERNAN Okay, 463. Is another of the same variety.
SCHMITT Wish we'd started on that structured rock
because we're going to run out of time. Let's go over there
and get at least one off of it.
CERNAN Yeah. We'll get it. Get the -
CERNAN Woops - got it.
SCHMITT Got it.
CERNAN Okay, why don't we -
SCHMITT What do you have picked out.
CERNAN This - this in here with the layering in it.
CAPCOM Go in there in about 2 minutes.
CERNAN The flight line photo - yeah.
CERNAN Did you get a flight line - I'm going to
get that from here.

SCHMITT Sort of noisy. How you going to go?
CERNAN I'll come around from this end and go around to that side.
SCHMITT Okay, I'll go perpendicular to you more or less.
CERNAN Boy, that one right behind it is just vesicular. Looks like a GARBLE of a high degree - like three times as much. I hope this badge wasn't in the way of everyone of those pictures. Okay.
CERNAN Boy, I tell you there ought to be a lot of permanent shaded samples in here, Jack.
SCHMITT Okay, I got the downsun.
SCHMITT Man. That's a hard moon. Just a little piece- but that's - see - how about this junk down there, Gene.
CERNAN Where you looking?
SCHMITT That'd - I don't think that'll - that plate piece.
CERNAN Yeah.
SCHMITT I don't think that'll come off very easy. Let's see that.
CERNAN Upshot, here try it - you're over there.
SCHMITT You know I've worn the RTV off the hammer already.
CERNAN Yeah, I saw that.
CAPCOM Roger, copy that.
CERNAN There you go, beautiful call. Beautiful call. Beautiful call. That's why - that comes from -
SCHMITT I wore the RTV - GARBLE
CERNAN That comes from 15 years as a trained hammer bearer.
SCHMITT By golly, your geology training did come in handy. You learned where to hit rocks.
CERNAN Bob, three - well, 464. Won't all go in there but -
SCHMITT Dry you can wrap it around it.
CERNAN I get it - no I get it babe. It's in there.
SCHMITT Okay.
CAPCOM Okay, now Jack and get the rake soil and maybe also get the soil off of the top of one of those boulders that you thought you saw.
SCHMITT Yep. Whew. I've got to have Gene with me since my can't carry sample bag on.
CAPCOM Roger.
SCHMITT I probably can if I'm careful but I keep dropping them.
CERNAN These rocks have an awful lot a much greater density of the white minerals in them or crystals, than I've ever seen before, Jack. Where did we see these kind before?
SCHMITT Well, when I looked at them first, that's what I thought - but I think that the zap pits are making the white stand out more. They are fooling you a little bit.
CERNAN They might because when I looked out of the hand lens it looked like a fairly normal gabbro - like some of

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those that have crystallized with the mare basalt. Where are you? You ready to take them back over here? What I want is a sample off one of these rocks. Okay, let's get that and now let's get the rake sample.

SCHMITT But it looks to me like the soil has been thrown up there rather than - this rock is about 3 meters in diameter and it - but it's one of the flat surface rocks. It only stands about - at the most - 1/3 of a meter high.

CAPCOM Copy that.

CERNAN But we can get up about a meter from the soil rock interface and get soil off the rock I think.

CERNAN Okay, see what you can do.

SCHMITT Whoops, oh yeah I've got some soil - don't kick up anything new.

CERNAN No, that's all right.

CERNAN 455 is that Bag number, Bob.

CAPCOM Copy that.

CERNAN Okay this is soil from a half a meter in - it's about a centimeter deep and a half a meter in. Let's take that chip that's flying on top with the next scoop.

SCHMITT In a minute. Let's take the soil on that.

CERNAN No.

SCHMITT I was looking - okay let's take that one then.

CERNAN Well, that's another bag. Put this - before you pick that one up put that little chip -

SCHMITT Well - I don't want to get the chips - I want the soil. Either that or a coherent rock.

CERNAN Okay, here you go. I think we better leave it at that.

CERNAN Okay, 465, pick this other one up and I'll bag it real quick.

CAPCOM Copy that.

CERNAN That's the soil from on top the rock. And we're taking a piece of the rock itself which looks pretty much like the other one, Bob. It might be a little bit more vesicular.

CAPCOM Okay, and that'll be in 466, right?

CERNAN You're right again. Here we are and I'll be able to grab it with my hand. Put this -

SCHMITT Okay.

END OF TAPE

SCHMITT Okay, the soil came from a half a meter in from the soil boundary. We need to get - let me get over here and try to get one bag of soil that's away from the boulder. I'm going to get my hands along here.

CAPCOM Okay, 17, roger. And the present time we drop the rake soil; we'd just like to get the kilogram of soil somewhere between the boulders. I'm hoping that you can.

CERNAN My scoop in that?

SCHMITT It will be. (garble) Okay, it is now.

CERNAN Oh, you want a kilogram?

CAPCOM Roger.

CERNAN From between the boulders?

CAPCOM Roger. That'll replace the rake soil sample we were going to get. And we'd like you moving in 3 minutes.

CERNAN Okay, let's do it right here.

SCHMITT Yeah, right there. Let me -

CERNAN Oh, okay. This will go - this will be a matched pair with our soil sample too.

CAPCOM Roger.

SCHMITT Okay, bag 467 is where your kilogram is coming from.

CAPCOM Roger.

CERNAN Another scoop full.

SCHMITT Yeah.

CERNAN And I'm sampling down to about 5 centimeters.

CAPCOM Copy.

CERNAN Get your hand down, please. I'm coming down to you.

SCHMITT Oh, okay.

CERNAN Okay, that's full.

SCHMITT That's 467.

SCHMITT Pinch it down tighter or it'll leak out.

CERNAN Now let me get your big bag tight. Okay, let me try to get a -

CERNAN Jack, you got a shot of where my scoop was, didn't you?

SCHMITT Yeah. Let me get an after of it though.

CERNAN Okay.

CERNAN Okay, Houston, we sampled about 3 meters southwest of the gnomon that was set up for the top of boulder soil sample. So it's a match pair, really, in that regard.

SCHMITT Don't forget your gnomon.

CERNAN I'm not. Now I need to get a pan - are you in a pan?

SCHMITT (garble) I've already started it. Okay, I'll go over near the Rover and get one.

SCHMITT Okay, I got the gnomon.
CERNAN When do you want us to leave, Bob?
SCHMITT (garble) do you read me?
CERNAN Yeah.
CERNAN Hello, Houston.
CAPCOM (garble) 17, loud and clear. We'd like you
to leave immediately, if not sooner.
SCHMITT Hipity hopity, hipity hopity, hipity hop over
hill and dale. (Singing) Hipity hopiting along.
CERNAN Okay, my golly, this time goes fast.
CAPCOM That's affirm. Okay, and when you leave here,
17, remember that we want to pick up EP number 8.
CERNAN I'm give you a reading.
CAPCOM Roger. We're ready.
SCHMITT Go.
CERNAN 06 - 070 031 and 401. 670 031 and 401.
CAPCOM Copy that. And when we leave we want to
take EP number 8 with us, guys. We'd like the SEP turned back
on and the blankets closed. Okay, Jack, I guess that's your
option, you may -
SCHMITT Let me be sure.
CAPCOM - stop and take the charge off when you
get to the distant. If it's only a short one, you might like
carrying it in your lap.
CERNAN Jack, I can hold it in my left arm here.
SCHMITT No, I'll get it. I'll get it.
CERNAN Okay, you want the SEP on?
CAPCOM That's affirm.
CERNAN Okay, both DSEA and the other switch.
PAO Explosive package number 8 is a quarter pound
charge.
SCHMITT Closed. Closed is - What happened to the
Velcro on that other side?
CERNAN I thought they mounted that thing, so that -
SCHMITT It came off, Gene. It's stuck to the Velcro.
CERNAN It's in it, fix it. Okay, you got the TC,
we'll get EP 8, the camera's going.
SCHMITT We made a mistake earlier and it's too late
to rectify it in carrying these charges.
CERNAN Oh, I don't know how I -
CAPCOM Negative, Jack. If you don't have it off, we
might want to carry this one.
SCHMITT That's right, that's right. I say the mis-
take was made earlier and is no problem now.

CERNAN Okay, traverse to LM low gain 100. Did you
turn this on?
SCHMITT It's on, all squared away.
CERNAN Push that thing down, it'll stay.
SCHMITT Just a little - there it is.
CERNAN Well, sometimes it will.
CERNAN Okay.
CAPCOM And how about a frame callup before you get
back on there.
CERNAN Yeah, I need some new - Do you want me to get
it here?
SCHMITT PDR's at 50.
CAPCOM Copy that.
SCHMITT 170.
CAPCOM Copy 170.
SCHMITT LMP's 170.
CAPCOM And Jack, it'd be my opinion, that you've
just gone back over the same (garble) that you came up this
morning. It's probably not necessary.
SCHMITT Okay, I'll use it until it runs out.
CAPCOM Okay.
CERNAN I am out of film anyway.
SCHMITT But when you leave me at -
CERNAN Okay.
CAPCOM Yeah, we'll let Gene take some of the photos
near the bomb, on neither charge (garble).
CERNAN Just jump up again and get your bounce. There
you go. You ought to come this way quite a bit.
SCHMITT Yeah.
CERNAN Up this slope.
CERNAN (garble) with you for some reason.
SCHMITT There it is, I guess.
CERNAN All right.
SCHMITT Up closer to you.
CERNAN Okay.
SCHMITT Okay, let's go.
CERNAN Okay, the switch is coming around.
SCHMITT Okay, traverse to LM: 12 minutes, 0851.4.
That's -
CERNAN Man, that's a 0861.4 to the LM, and my check
list 0851.4. Must have landed where they wanted us to.
SCHMITT Just about.
CERNAN Hey, Bob.
CAPCOM Roger.
CERNAN You know where we landed yet?
CAPCOM No, we think so. We've been transacting back
inside (garble).

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SCHMITT It must be pretty close.
CERNAN You bet your life. I'm reading 0851.4, and
that's what my checklist said.
CAPCOM Roger.
SCHMITT Okay, Bob, I guess my impression, and it's
purely - pure interpretation right at this stage -

END OF TAPE

CERNAN Okay, Bob, my impression and it's purely pure interpretation right at this stage that Camelot is mantled by whatever has formed the dark mantle.

CAPCOM Copy that.

CERNAN It does not seem to be mantled to the degree that Horatio is.

CAPCOM Okay, copy that.

CAPCOM Then give us a mark when you're going - then give us a mark when you're going

SCHMITT I'm sorry Bob -

CAPCOM And we don't have -

SCHMITT Wait about - a minute

CAPCOM Okay, copy that. And we don't have battery temperatures here if you could quickly give them to us. And we don't have battery temperatures here if you could quickly give them to us.

SCHMITT Okay, I never did give you that. It's 110 and 136.

CAPCOM Copy that, good enough. Thank you.

SCHMITT Never did get that for you. But I tell you the inner wall of Camelot is - The inner wall of Camelot to the east is certainly blocky.

CAPCOM Well there were a few blocks where you guys were too.

CERNAN (garble) mantle too, Jack.

SCHMITT Yeah.

CAPCOM Well there were a few blocks where you guys were too.

CERNAN Yeah, well, you could see the other wall too. It's- Hey, here's some Rover tracks - Hey somebody's been here before.

CAPCOM Okay, and 17, what we're looking for is deploying charge number 082 and charge 0.4 on the range.

SCHMITT Okay. Okay, we're at 083 and 1.1. We're just about abeam the eastern rim of Camelot. And there's Challenger.

CERNAN Hey, hello Challenger. You can even see the ALSEP. I think I'll go this way. (Laughter.)

SCHMITT Gee, it seems like a short day. (Laughter)

CERNAN Well, I'll tell you the time went fast.

SCHMITT Say, you've heard about this country. Say, looking over there though, there's no - We're about oh, 50 meters from boulders at Camelot. And there appears from this distance is the same that we sampled from 5. I think we have pretty well identified the subfloor, Bob.

CAPCOM Okay, sounds like we have and sounds like from the very deepest - even from the bottom of Camelot it looks like it's about the same.

SCHMITT It sure does. I can't say I understand it. But that's the way it appears right now.

CAPCOM You can't say what, Jack? Okay, understand that.

SCHMITT I can't say that I understand -

CAPCOM Copy

SCHMITT Whatever filled this valley - It certainly was different than the Massif. I think we've proved that. And it presumably - at least everything I see indicates that it was an igneous extrusion of some kind. Either that, or we're - the whole valley's been tilted and we're looking at a some strange cross-section plainer more or less relative to the other mountains of a crystalline body that was formed in depth. But, I don't think that's likely.

CAPCOM Okay.

CERNAN We've covered 19.3 kilometers, Jack.

CAPCOM That's outstanding.

SCHMITT Is that what we planned to cover?

CERNAN I don't know. What did we plan to cover

Bob?

CAPCOM Stand by. But, we've been everywhere we've planned to go, so, we must have gone just about as far as we've planned to go.

SCHMITT Yeah, but the straight lines. I don't know what the wander factor was, but I'm sure it was pretty high.

CAPCOM 17.6 they're telling me, so we went a little bit out of our way.

CERNAN Well, it's all mileage.

SCHMITT 0.7 and what was the bearing on, 083?

CERNAN 082, I think but we want .4

CAPCOM 0.4, guys.

CERNAN Oh, 0.4.

SCHMITT Yeah, that's the range.

CERNAN Yeah, that's what I said.

SCHMITT But you want to bear north, don't you, little.

CERNAN Yeah, I want, what'd you say 082 didn't

you Bob?

CAPCOM That's affirm. That'll be close enough. It's probably right on your track there.

SCHMITT Well, I don't make a habit of following myself. I like to cover new ground.

CAPCOM Okay, copy that.

SCHMITT Yeah, but watch out for that new ground there looks like - Look at the Italian flag.

CERNAN Hey, there is one there. I saw the box before I saw the flag. No, I didn't I saw the flag first I've got to admit it

SCHMITT Come on now.

CERNAN I've got to admit it I saw the flag first.

SPEAKER The boss said you saw the flag first.
CERNAN I'm 082 and I'm .5. I'll just head
right in towards the LM. Man I want to stay away from
ALSEP, I see the big boulders so I'll -
SCHMITT Okay.
CERNAN I'm going to go around - 0.5
SCHMITT You'll have to swing right after we
deploy, probably.
CERNAN Yep.
SPEAKER Whooh.
SCHMITT Didn't we get any glass out of the
bottom of those craters?
CERNAN No we haven't we've got to try to do
that before we leave. There haven't been -
CAPCOM Some time you'll have time to do that
I guess, guys, I'm not sure when.
SCHMITT 4.
CERNAN Okay.
SCHMITT Okay, 08, well she just went to 1.
Okay 08 1.4.
CERNAN Okay, let's put it in that little de-
pression there. See right ahead of us to the right.
SCHMITT Okay.
CERNAN Can you.
SCHMITT Got your pictures.
CERNAN I'm getting them.
CERNAN Okay, now just swing into that depres-
sion and I'll put it there. Beautiful. Oh, oh, okay,
charge number 8.
CERNAN You didn't get a picture to the LM, did
you?
SCHMITT Yeah, I did. I got several of them.
CERNAN We don't have to take any more do we.
SCHMITT Nope.
CERNAN Okay, antennas deployed. 10 1 is pulled
and safe. Now let me check that, it's dusty. Yeah, it's
safe. 10 2 is pulled in safe. 10 3 is pulled and safe.
CAPCOM Copy that.
SCHMITT I guess as long as it didn't go off.
CERNAN Whooh, don't bang it. I don't care
what they -

END OF TAPE

SCHMITT Oh, don't bang it. I don't care, say what they say, that's a charge.

CERNAN You're having great luck with those.

SCHMITT You're right.

CERNAN Okay, the LM was in the approach (garble), I believe, let me -

SCHMITT Go ahead and turn around -

CERNAN Yes, I think I'll go around anyway.

SCHMITT This way I get a running shot of - right in the middle of it - let me get you - get them both in it.

CERNAN Okay, I ran out of film, too.

SCHMITT Oh, boy.

CERNAN But that's pretty well located.

SCHMITT Where is it?

CERNAN When you come around, take a picture of the LM on your camera.

SCHMITT I'll take it right at the front looking right at the thing.

CERNAN Yes, and give them a frame count.

SCHMITT About a 56 -

CERNAN 56, Bob, I've got the locator of the charge and the LM all in the same order here, and I am one more than I just gave you. I can't look at it now.

CAPCOM Okay, one more than what you gave me at station 5, understand.

CERNAN You want me to go to the gravimeter, now.

CAPCOM Roger. And if you guys will start out, we'll drive you by the ALSEP, Gene - Jack, and if you'll get out at the ALSEP, we'll have you look at the surface gravimeter and Gene can press on home to the LM.

SCHMITT Okay.

CERNAN Jack, I'm going to drive you in this way, and then I'll drive all the way back around at 1 geophones, okay, shall I -

SCHMITT But you're to the north, you could drive in toward the heat flow, towards that big rock, if you can see that.

CERNAN Yes, well okay, that's as good as anything. Bob, you want me to get some ALSEP pictures?

CAPCOM Negative.

CAPCOM Okay, and Jack, you can stand by for a feedwater dump very shortly. Okay, feedwater, go to OX, please.

SCHMITT I just got it.

CERNAN Man, look at that mess of cable. I hope that thing's working, Bob.

CAPCOM A lot of it's working, we've just got to try and see if we can't level this thing tonight. When

CAPCOM you get off there, Jack, I'll talk to you
a bit about procedures for that. And in the meanwhile, it's my
understanding that the second UHT is not in the immediate vicin-
ity, where it's accessible, is that right?
SCHMITT No, it is, I can get it.
CAPCOM Okay -
SCHMITT Okay, and watch my heatflow over there,
don't trip over them.
SCHMITT Okay, I'm going to take a pair of tongs -
CERNAN Do you have any film at all?
SCHMITT No, I want your camera.
CERNAN You want my camera?
CAPCOM Okay, Jack, you won't need to - we
aren't planning on taking the ALSEP photos right now.
SCHMITT Oh, okay.
CAPCOM Okay, and Jack, we're not sure you went
to OX on your water yet.
SCHMITT I thought I did.
CAPCOM Okay, it's coming up, now, we see it
coming Jack, don't worry.
SCHMITT Gene, can you - okay.
CERNAN Did you get what you want.
SCHMITT Let me take this other tong in case I
drop something.
CERNAN Can you reach it?
SCHMITT Yes.
CERNAN You got everything you need?
SCHMITT Yes.
CERNAN Okay, Jack's got my camera, and tongs
and I'm on my way.
CAPCOM Okay, copy that.
SCHMITT Okay, I got a tone again, Bob. I got a
tone again.
CAPCOM Okay, what's it say? Probably just to
water - it's been building up -
CERNAN I can't - I can't read my gauges.
SCHMITT Want me to take-
CERNAN We better take a look.
SCHMITT Okay, I'm coming over there.
CERNAN I think I just got my water tone, Bob.
CAPCOM Okay, that's right, also.
CERNAN Okay, OX water done.
SCHMITT We got our tones yesterday.
SCHMITT Can you see anything?
SCHMITT No -
CERNAN Let me see, let me - bend over.
SCHMITT You don't have - a brust okay, to brush off -
no flags.
CERNAN Okay.
SCHMITT Hey, wait a minute, you got no flags.

CAPCOM You look good down here, Jack. Jack,
you look good to us.

CERNAN No flags. Alright, no flags, Jack.

CAPCOM Okay, and Gene, I think you need to go
OX, if you didn't.

CERNAN Yes, I just did, Bob, and my water flag
cleared.

CAPCOM Okay, copy that -

CERNAN No, it didn't - not yet.

CAPCOM Yes, it's probably slow coming up.

CERNAN Okay, Jack, just be careful of the
cables.

SCHMITT Okay, you want me to get a UHT, huh?

CERNAN It's right over there by the -

SCHMITT Yes, I know where it is.

CAPCOM If it's quite close, but if it's not,
don't bother, I think we can probably drive it by hand.

CERNAN No, it's there, Bob, he'll get it.

CERNAN You got a heading for me at the Rover,
will 017 do it?

CAPCOM 018 - 018.

SCHMITT You don't want me to kick the lean yet,
huh?

CAPCOM Negative.

SCHMITT Okay, Bob, I've got a UHT.

CAPCOM Okay, when you go back to the LSG, Jack,
we first of all would like a reading of where the bubble is
in the circle, whether it's in the center, and what we're
going to have to have unfortunately, is to have the bubble
centered in the inner circle because this is apparently, a
requirement, even though we didn't train to it, apparently
it's something that came up, and it's going to have to be
within the inner circle of the bubble. The first thing we need
to do is when you go up there is to see whether the bubble is
in the center of the circle.

SCHMITT Okay, Bob, that bubble is centered.

CAPCOM Okay, okay, the next thing we want you
to do is put the UHT in the socket there, and move the -

SCHMITT Hey Bob.

CAPCOM LSG from side to side, do not pick it
up, okay go ahead, Jack.

SCHMITT I did not have to touch it, it is centered.
Okay, but now they're worried that it's stuck like your gimbal
thing was last night and also, the thing is that maybe some-
thing's hung up inside and in moving it we can jostle it
free. They do not want it picked up, but they'd like to
have UHT put in there and sort of have the instrument rocked
from side to side to again see the bubble move, and once
that is done, to then press it down into the ground and

CAPCOM Again realign it and put the bubble within the inner circle. Over.

CAPCOM They would also like to see if the gimbal is free.

SPEAKER How much do you want me to - How much do you want me to rock it. How far should I let the bubble travel.

CAPCOM Basically we just want to see it move if you go up to the outer circle, that's plenty.

CAPCOM And again, you can (garble)

SCHMITT There's only one circle. Okay.

CAPCOM Oh, I mean the outer rim, the rim of it.

SCHMITT Okay, I did that, it's still centered and the gimbal is swinging.

CAPCOM Okay, we copy the gimbal is swinging and we copy you moved the bubble out to the edge of the bubble level and come back in to circle.

CERNAN That's right.

SCHMITT Okay, Bob, I'm reading 089. 20.1, 002, 92, 88. Boots are 65 and 66 batteries are 114 and 138 (garble) motors are off scale low forward (garble) is off scale-low and (garble) is 210 degrees.

CAPCOM Copy that, what's the first battery temperature there, Gene?

CERNAN First battery temperature is 1-121.

CAPCOM Okay, Jack. They apparently don't believe you when you said you aligned it last night and they're concerned the shade (garble) of plane degrees. Copy 114 on that battery temperature Gene.

CERNAN It's on 20 Bob.

CAPCOM Okay, in that case I guess you're free to come home.

SCHMITT Well, what is basically the problem with it?

CAPCOM They haven't been able to level it for some reason and they were afraid that the thing wasn't level. They were hoping also maybe by moving it that you might jostle it a bit and it would come to level, but I think we'll just have to think about it some more. But, at first presumption, the easiest solution was to have it unlevelled, which case we could fix it this way. But I guess tha -

END OF TAPE

CERNAN Or more. The first presumption - the easiest solution was to have it unlevel in which case we could fix it this way but I guess that's not the case. We'll have to see what happens overnight. Give us the chance to follow the tradition and come back to the ALSEP tomorrow.

CERNAN Well, do you want me to change it's position's level a little bit - put it off level a little and see if you can work it.

CAPCOM I don't think so Jack, that doesn't sound very good to me. Why don't you just leave it there if it's centered with the level bubble within the inner - within the inner circle there. That's the requirements as far as you can tell and we'll just have to leave it over night again and why don't you come on back to the LM.

CAPCOM Okay, Gene are you at the Rover?

CERNAN Yes sir, I'm parked.

CAPCOM Okay -

CERNAN Let me give you my reading.

CAPCOM Okay, you gave me my - your readings and when you get done let me know because the first thing we want to do is work on the SEP a little bit.

CERNAN Okay, stand by.

CERNAN Get TV. Okay, what do you want to do to the SEP?

CAPCOM Okay, Geno, I when you go back to the SEP now - I'm going to do this first and get -

CERNAN What do you want to do to the SEP.

CAPCOM Okay, Geno, I want you to go back to the SEP now and let's do this first and get it out of the way and it'll you can probably do this anyway while Jack's coming home. When you open the blankets remember that it's the back of the SEP there was a piece of velcro on the case and a piece of velcro just above - just inside the rear hinge on the covers and this is what you sort of peel back when you go to remove the back end there so you can get the DSEA out. Remember that piece of tape there.

SCHMITT Yeah, that came off. That came off.

CAPCOM Okay, this is on the side away from you when you stand facing it. Right?

SCHMITT Oh, no that's the side - go ahead, Gene I'm sorry. Okay, go ahead.

CAPCOM Gene, if you stand facing it in the back away from you is this - there's a strip of velcro on the case and there's another strip of velcro on the blanket itself and this is the velcro you have to tear off or unhook as it were, but when you come to tear the blankets down to get the DSEA off, remember that piece?

CERNAN Yeah, but that's on the side away from me. I'm on the LMP side - that's on the other side.

CAPCOM Right, that's on the other side of the top and what we're interested in - number 1 is that piece of velcro still mated or when you open the blanket to cool it does that velcro come open, over.

CERNAN Well, that's the velcro that's so full of dust it comes open, Bob.

CAPCOM Okay, and so what happens -

CERNAN Trying to stay - it's locked - it'll stay.

CAPCOM Okay, well the feeling is -

CERNAN I don't know if you can see that but it's -

SCHMITT Well, you can't depend -

CAPCOM Okay, well feeling is that -

SCHMITT Bob, the GARBLE, the cover is in it - will stay open about 150 degrees.

CAPCOM Stand by a minute. What you're saying is that the cover actually stands up a little bit in space.

CERNAN Now, if you want the cover open I can open it and normally it should swing 180 degrees parallel with the top of the steps.

CAPCOM Okay, but does that velcro in back stay mated?

CERNAN The velcro holds - the way we've been opening it - it holds. Yes, it's being mated but it probably holds the covers open 150 degrees.

CAPCOM No. That's okay. What we're - talk - what the concern originally was was that when this happened the front light was getting down in the back there and warming up the back of the SEP. That's apparently not the case. Over.

CERNAN No, that's not the case. The velcro that came off is the velcro that helped the - keep the covers closed.

CAPCOM Okay, we were concerned about both pieces of velcro since one had come off.

CERNAN Now the other one is still on and it still holds. In the back part of the SEP where the DSEA is is in the shade.

CAPCOM Okay, I copy that. Okay, while we're talking about this I'll get back with you. Turn the DSEA and the receiver both to OFF, please. And read me a temperature, please.

CERNAN 112 degrees.

CAPCOM Copy that. And I mark them both off, right?

CERNAN Yes.

CERNAN Bob, I just dusted - it's clean as it'll get.

CAPCOM Okay, thank you.

CERNAN Hey, Bob.

CAPCOM Go ahead.

CERNAN I cheated on you.

CAPCOM I was sure you would. What did you do.

CERNAN I just sampled the glass in the bottom of a crater. I documented it by shooting the LM across the crater at

Infinity and then shooting the crater with stereo. At 11 feet and in that cross sun there it's 7 and then I sampled it.

CAPCOM Okay.

CERNAN Then I took a cross sun pair there at 7 after.

CAPCOM I guess now gnomon is a LM.

CERNAN It's very fragile.

CERNAN That's right, it's very fragile and I double

bagged it - I don't know whether we can keep it or not.

CAPCOM Okay, we'll hope.

CERNAN Think about how to preserve it.

CAPCOM Okay.

CERNAN While you're thinking I'll put it on my floor

pan I guess.

SCHMITT Okay, what do I have to do here.

CERNAN Get this bag off me.

SCHMITT Get that bag off you to start with. Be

careful of that sample there.

CERNAN Those are the cleanest battery covers in existence on a rover right now, I tell you. Oh, you don't believe me - look at that.

SCHMITT What?

CERNAN They don't believe me.

SCHMITT Excuse me. Move forward just a little.

SCHMITT Now get your bag. Here you go.

CERNAN Now you're stuck down there, aren't you?

No, you're not. I maybe going nuts talking to that moving machine over there.

SCHMITT Boy, we don't need any hooks I'll tell you.

CERNAN I know it.

SCHMITT Can you stoop just a little bit.

CERNAN Yeah all that stuff - there it's fixed.

SCHMITT Get your hook back.

CERNAN Okay, I hooked my harness back up so don't

forget that.

SCHMITT Velcro is closed. Okay.

CERNAN You know as you look at those little sparkles in the soil we're walking on and they change colors on you. Greens, and purples, irridescent. Irridescent sparkling.

SCHMITT Okay, I'll come over and I'll unload your stuff.

CERNAN Okay. Now, we've got more samples than we've got sense - I think. Let's see here - you've got - you're taking care of the SEP.

SCHMITT Yeah, that's all right.

CERNAN Okay. Hey Bob, the battery covers - the covers are open on the SEP rather.

CAPCOM Roger, copy that.

CERNAN Oh, why did I do that. Hey, Bob, you think that glass sample would be better off in the SRC?

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CAPCOM We're still talking about that.

CERNAN Wait a minute your core cap assembly is empty. Up and away it goes. And that's all closed. Check your bag. Okay, now Bob, you've got to tell us which one of these you want in the SCB and which one you want just taken in because we've got our numbers all confused.

CAPCOM Okay, go ahead. What we would like to do here on the closeout - guys let me read this to you first of all. In the SRC we'd like the following stops along with - let's see - stand by.

END OF TAPE

SCHMITT Following - stuck - along with - let's see seven.

CERNAN Is this 9 or 6.

CAPCOM Okay, guys, we're going to follow a Apollo 16 mode and put stuff in loose. Because I'd like to segregate stuff in the following way. I'd like to put the long can and 4 core tubes in the SRC. I guess it's going to take a long - going to take awhile just carrying things back and forth. But they'd probably like to get this in because it's a volatile stuff. They'd like to get the long can and three core tubes in the SRC number 1. And then we'd like to get all the SCB floor samples in the same SRC. Over.

SCHMITT Oh, wait a minute. Wait a minute.

CERNAN Yeah.

SCHMITT Okay.

CERNAN 3 - 3 - 3 plus a long can in. 4 cores altogether.

CAPCOM Right. Put those in the SRC.

CERNAN All samples from 4.

CAPCOM All the samples from SCB 4.

CERNAN Okay.

SCHMITT These are 4. You want to get the core tubes in first, don't you?

CERNAN Yeah, I want to put these in.

CERNAN If you'd give me the - yeah, I've only got two hands. I'll come back by the time you pick them out.

CAPCOM Okay, and then - 17, do you guys remember where the trench samples - the 3 trench soil samples - which bag those were put in - from station 4. Over.

CERNAN Yeah, let's see. I'm the only one who had bags so I imagine I put it in whatever bag jack had, I think.

SCHMITT Yeah.

CAPCOM Okay, then that'll be SCB 4, so we'd like those in SCB 4. And those are the ones that will go in the rock box and that's in agreement with what we want to do.

CERNAN Okay, give me those other 2 cores if you've got them, Jack.

SCHMITT Okay.

CERNAN Long can.

SCHMITT The long can. Here's a - oh. Got it? (garble).

APOLLO 17 MISSION COMMENTARY 12/13/72 00:17 CST 147:23 GET MC591/2

CERNAN One more core.
SCHMITT One more core.
CERNAN Okay.
CERNAN That right now? Three core tubes and
a long can?
SCHMITT Yep, got them all.
CAPCOM And then - roger that - and then SCB 4 - all
the samples in SCB 4 - We won't bother to try and sort them
out and then beyond that we'll fill them up with samples
from SCB 5. Over.
CERNAN Which one is that?
CERNAN That's 5. Let me get 4 first.
SCHMITT Yeah. Here, hold this. I'll get it.
CERNAN Well, it's on the gauge right there. Just
hanging. I just put it there.
CERNAN 4 is the one I had on there at Shorty.
CERNAN Or you had on at Shorty?
SCHMITT Yeah, you had it on. I don't know but
- they should have that log. I don't remember who had it
on.
CERNAN Well, wait a minute. I took the trench.
You held the bag and I put them in you.
CERNAN You put them on me. Did I have 4 on at
Shorty?
SCHMITT Yes.
CAPCOM That's affirmed. That's why we want
SCB 4 put in the - or dumped into the thing. But if it's
dirty bags we just want to dump the samples in.
CAPCOM Okay?
CERNAN Okay. And you want 5 to fill it up.
SCHMITT Okay, Bob.
CAPCOM Okay, and Jack, it probably would protect
the glass a bit better if you put it in the SRC gently with
the other rocks there. But lift easy - don't fill the SRC
too full. But again, we'll be putting SCB samples in there to
more or less flush it out if there's not too many SCB 4 samples.
Schmitt Leave a space for a sample, I guess, Gene.
CERNAN Yeah, you'd better give it to me. There's
not much space. It's going fast.
SCHMITT You really - well, can you leave one.
CERNAN Where is the sample?
SCHMITT Well, it's over here.
CERNAN I'll get it.

SCHMITT No, I'll bring it to you. I just -
SCHMITT There's some way -
CERNAN just set it in there. Doubt that and I'll
be talking with him. Take this bag back.
CERNAN Okay, it's in the right hand back corner
of the SRC.
CAPCOM Okay, copy that.
SCHMITT There just about full - you got some left
in there?
CERNAN I got some small ones. And some big
ones.
SCHMITT Don't fill it too full.
CERNAN Nope.
SCHMITT Hey, we got some big rock samples.
CERNAN Okay, Bob. SCB 6 and SC - wait a minute -
what's in 6?
CAPCOM 6 - probably nothing. But tell us.
CERNAN Oh, there's samples in 6.
CAPCOM Okay.
CERNAN Upp.
CAPCOM Should have that SCB 8 under your seat with
samples in it.
CERNAN This is what I sampled at sample.
CAPCOM At station 3, maybe.
CERNAN 6 has the samples from - yeah.
CAPCOM Okay, let's take up SCB 8 and let's take
up SCB 6 with along - and why don't you dump out the rover
samples into SCB6?
SCHMITT Well, one reason not to take 6 is I don't
know if I can get it off.
CAPCOM Okay. And let's save SCB 4 because I think
You may need that tomorrow.
CERNAN 4 is on the rack, empty.
CAPCOM Okay. How about SCB 5? Is that only
partially emptied or is it totally emptied.
CERNAN Oh, it's about half full, Bob.
CAPCOM Okay, we'll take that up with us.
CERNAN Bob, I've already - Let me tell you what
I've done. I've got SCB 8 full.
CAPCOM Okay. Copy that.
CERNAN Let's take it up.
CAPCOM Roger on that.
CERNAN It's got rover samples in it.
CAPCOM Okay.
CERNAN But I can't get them all. They won't
all be in there.

CAPCOM Okay, 8.
CERNAN Okay, Bob, the seal was clean. It was clear, and I got your 4 cores - 3 cores, plus a long can. I got Jack's glass. I got SCB 4 and a couple of samples out of SCB 5.
CAPCOM Copy that. Sounds great.
CERNAN Okay, now, where was I?
CERNAN You got me all out of whack, here.
CAPCOM That's affirm.
CERNAN Core cap - okay, you're clean. Cosmic rays - yeah. SCB 5, Okay. Now Jack, we've got SCB 5 that's half full. What have you got over there.
SCHMITT Bring it over here and I'll put it into 6.
SCHMITT 6 is half - a little more than half full.
CERNAN Well, it's a little less than half full. That ought to make one full bag. Hey, these big rocks - they don't come out easy. Where's that big, big rock we got? That's in one of those bags too. Picked up a big one - here let me see if I can't dump it.
SCHMITT How's that for a lunar dump.
CERNAN Huh?
SCHMITT Perfect.
CERNAN I want to see if I can't - did you lock this one over here? - No.
SCHMITT Hey, don't lock those -
CERNAN No, I'm going to see if I can dust them and make them and make them work easier.
SCHMITT Boy, I'll tell you - I really had to pull. I pulled harder than I like to in a pressure suit.
CERNAN See if I can -
SCHMITT Okay, Bob. SCB 8 and 6 are going up.
CAPCOM Okay and I understand 5 will be on the gate.
CERNAN Yes sir, Bob. It'll be there.
CERNAN And 7 under the LMP seat.
CERNAN 4 and 5 will be on the gate.
CERNAN You know, here's a problem for you tonight. You got any way of freeing up these gate hinges that lock the bags on? I'm dusting them but they're not going to lock - any of them. They're frozen tight. Just about -
CAPCOM Okay, copy that. We'll think about it.
CERNAN If you do get them locked - if you do get them locked you may never get them off.
CAPCOM Okay, we'll get to work on them over night.

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CERNAN Okay, I'm dusting them right now but
I still can't free them up.
SCHMITT Man those are heavy bags.
CAPCOM Jack, have you got the proper bag closed?
SCHMITT Yeah, what do you need?
CAPCOM Okay, John, thought maybe they were still
open. He was worried.

END OF TAPE

CERNAN Yes, what do you need?
CAPCOM Okay, no John thought maybe you were still open, you weren't.
CERNAN No, I lied to him. I'll check them again, before I go up.
CAPCOM Okay, and we get no SSR's on the UTB We understand, roger.
SCHMITT No, I just checked and there's - it's all - they're all in the bags. And the Rover sample bag is empty.
CAPCOM Copy that.
SCHMITT Nothing left.
CERNAN Bob, neither one of these bag latches are going to latch on the back, I dusted them, but they're not going to work, I can't free them up -
CAPCOM We'll talk about it tonight, don't worry about it now.
CERNAN Yes, we can probably use the seat, we've got a little more room than we had. Okay, let me get something else done. I wonder if I ought to take a sample bag holder up there to see if I can fix that, to see if it fixes.
CAPCOM Roger, Jack, I suggest that.
SCHMITT Okay, receivers been dusted and blankets are open, power is off and off. Okay, I'm going to take the TGE off now - dust it and then take it off, and then just leave it there. Hey, congratulate Jose' on that fender cause I think he just saved us an awful lot of problems. He and whoever else worked on it.
CAPCOM He mumbled something very humbly about a thousand guys.
SCHMITT Well, tell him that's going to be my bring home present to him - a picture of his fender.
CERNAN Okay, Bob, unused gear, which you have an inventory on - under the LMP's seat.
SCHMITT Okay, where am I? I'm bringing the GG over here, but I'm not pushing it yet.
CAPCOM Okay, copy that.
SCHMITT (garble) deployed. Man, I got the sorest hands in the world, right now.
CAPCOM How about on the Moon?
SCHMITT (singing) Nothings in the big bag is it? I just can't compete with you astronomers.
CAPCOM Just keep trying.
SCHMITT Nothing's in the bag, is it? Big bag.
Nothing's in the bag bag.
CERNAN Okay.
SCHMITT And there's one rock that disappeared yesterday, I don't know what happened to it.
CERNAN Hey, we forgot the polarizing filter work.
SCHMITT Yes, I saw it on the checklist, and I mentioned it to Bob, and he didn't come back with anything.

CERNAN Okay, I guess I'm going to go ahead and -
SCHMITT Put those in the, under that seat, please.
CERNAN Yes, there's only one left.
SCHMITT One? No, there's 3 or 4 -
CERNAN Just put them under there.
SCHMITT Who knows, we may need them at the rate
we're going.
CAPCOM Okay, and Jack, while you're unloading
there, on the 500 millimeter, you might squeeze off a few
shots of the North and South Massif, to see if there are
any lineations visible.
SCHMITT Okay, I'll give it a try. Why, are we
ahead of time?
CAPCOM No, we're working right on time.
SCHMITT Okay.
CERNAN Why don't you give it to me while you're
packing the ETB, Jack, I'll do it. Am I behind you now.
SCHMITT Yes, I'm going to start inventoring the
Rover and pulling the breakers so -
PAO We're at 7 hours 2 minutes and anticipate
ending the EVA at 7 hours 30 minutes.
CERNAN Man, we are so far off nominal on what
bags. I sort of didn't think -- the checklist is going to have
to be updated, I guess.
CAPCOM Totally.
CERNAN I should call - mag Charlie.
CAPCOM Copy that.
CERNAN Mag Kilo.
CAPCOM Copy.
CERNAN Mag Bravo.
PAO That's Gene Cernan using the camera with
the 500 millimeter lens.
CERNAN Mag Golf.
CERNAN Mag India.
CAPCOM Copy all those. And tell Gene, that
we can confirm that his lens cover's off.
SCHMITT Okay. Confirm that your lens cover's
off. The scissors are in.
CAPCOM Copy that.
SCHMITT And the brushes, I hope this is the
right setting. Hey, try F56 directly down-sun or up-sun at
that Sculptured Hills there in the distance - see where I
mean? I'll get it.
CERNAN Okay, Bob. What else do I need here?
Let's see, 500 mag ON, need mag ON.
CAPCOM Yes, I think we've got enough of those
now, Gene. You got the map?
CERNAN Jack's got them.

SCHMITT Some of these won't overlap, Bob, cause I'm hurrying.

CERNAN Don't smear them.

CAPCOM Don't hurry and smear them.

SCHMITT They're not smeared, but I just didn't overlap some of them.

CERNAN Okay, everyone agrees to that. Don't hurry and smear them.

CERNAN I'll get those others, Jack, tomorrow.

CAPCOM Okay, you got the maps in there, too, Jack?

SCHMITT Frame count, Bob is -

CERNAN Yes.

SCHMITT Frame count is 152 on the 500.

CAPCOM Copy that.

CERNAN Let go of it.

SCHMITT There. Okay.

CERNAN Dynamics, did you cycle it twice?

SCHMITT No, I'm cycling it twice.

CAPCOM Do you have the maps there, Jack?

SCHMITT Okay, I guess I'll go in and pull some Rover breakers.

CAPCOM Okay, and - Roger, copy that.

SCMITT Oh, boy. Pulling breakers is not going to be much fun.

CERNAN You want some scissors or something?

SCHMITT No. Oh, boy, oh boy, mag Romeo.

CAPCOM Copy that. You got the maps Jack?

SCHMITT No. (laughter) you ask me that one more time partner, and I'm going to get mad at you. Oh, I got - What have you got - you got the scissors?

CERNAN Yes, you want them?

SCHMITT I got 3 or 4 breakers, let me try this one more time. Okay, I got it - with the old fingers.

CAPCOM Okay, copy that all 4 are out, Gene.

CERNAN Okay, alpha, bravo, yes sir, alpha, bravo, Charly, delta are open. I'll get the LCRU power.

CAPCOM Okay. And Gene, when you leave the camera, a reminder to face it away from the sun and tilt it down.

CERNAN Okay.

CAPCOM Hey, Gene. That's not quite away from the sun, really it ought to be downsun.

CERNAN I'll -

PAO And that will end the TV until EVA 3 tomorrow.

CERNAN Bob, are you reading?

CAPCOM Roger, loud and clear.

SCHMITT I read you, Gene.

CERNAN Yes, I just turned LCRU power off and I got to go through the LM.

APOLLO 17 MISSION COMMENTARY 2/13/72 CST 00:27 GET 147:33 592/4

CAPCOM That's right.
CERNAN Bob, do you read?
CAPCOM Loud and clear.
SCHMITT Does this gravimeter work?
CERNAN No, it's not. I didn't push it yet.
Hello, Houston, come on, otherwise I'll turn this power back
on.
CAPCOM Read you loud and clear, Gene, do you
read Houston?
CERNAN Let me turn it on and talk to them.
CAPCOM We read you loud and clear, Gene.
CAPCOM We read you loud and clear, Gene.
CERNAN Well, I just turned the LCRU back on.
Are you reading it through the LM, now?
CAPCOM Yes, we came through the LM that time.
CAPCOM Yes, we came through the LM that time.
CERNAN Okay, I'm turning it off, and the camera
is pointed down and pointed -

END OF TAPE

CAPCOM We came through the LM that time.
SCHMITT Okay, I'm turning it off and the camera
is pointed down and it's pointed effectively to the west.
CAPCOM Okay, copy that. Very good. Thank you.
SPEAKER LCRU powers going off.
CERNAN Okay LCRU power is off Battery covers,
open battery covers. They're all dusted already.
CAPCOM Copy that.
CAPCOM Roger. They're reading us.
CAPCOM 17, you read Houston?
CERNAN Uh ooh, I've got to work on one battery.
CAPCOM 17, you read Houston?
CAPCOM 17, you read Houston? Over.
SCHMITT Hey, Bob.
CAPCOM Roger, 17. Do you read?
SCHMITT Still there? We're supposed to be going
through the LM see.
CAPCOM 17, do you read Houston?
CERNAN Got something fouled up. Maybe we've
got the switches wrong or something up there. Don't
think so, though.
SCHMITT No.
CERNAN They talked to us first.
SCHMITT Let me give them a call.
CAPCOM 17, do you read Houston? Over.
SCHMITT Bob, you want to try again, we're
on the LCRU. Yeah we read you, but I'm on the LCRU again
we're not reading you through the LM.
CAPCOM Yeah, I don't understand that, stand by.
Press on with the rest of the close out.
SCHMITT I'll leave you on the LCRU here.
And we're pressing on.
CERNAN Okay, for the first time I've got to
dust the center battery cover all the others are good.
CAPCOM Okay, Roger 17. Do you read Houston,
now?
CERNAN Yeah, but I'm on the LCRU, I don't
know.
CAPCOM No, now they say we're going back to
the LM again. Press on with the close out.
CERNAN Okay, Bob. I'm going to go turn the
LCRU power off and for the first time I've got to dust
the center radiator on the batteries.
CAPCOM Okay cop -
CERNAN The center radiator on the batteries -
CAPCOM Okay, copy that.
CERNAN Until this time, they've all been
real clean.

CAPCOM Okay, copy that.
CERNAN Okay, give me a short count, and in the interim I'm going to turn the LCRU power off.
CAPCOM Okay, roger. 123, 321.
CERNAN Yeah, we've got you Bob.
CAPCOM Okay, we've got about 20 minutes before we have to be inside the LM there, fellows. Let's hook along.
CERNAN Oh, I think we'll just sort of take it easy Bob.
SPEAKER Okay, the MESA is tidy, -
CAPCOM Thank you.
SPEAKER I've got the canisters, there's the (garble),
CAPCOM Copy that.
CERNAN The LM canister's in the pocket -
CAPCOM Very good.
SCHMITT And let's see. I think I'm ready to dust, can I help you?
CERNAN No, I'm leavin here right now.
CAPCOM Okay, and Gene as you go by, how about giving us the SEP temperatures readings?
CERNAN Oh, me. I will.
CAPCOM 17, Houston. That's awfully quiet.
CERNAN Okay, Bob, here's your readings. About 100 and ah - about 108 to 10 degrees.
CAPCOM Okay, copy that. Okay, we'll leave it there as is over night. Thank you.
SCHMITT And I'll give it one good little smack with the brush. And it's as clean as it'll ever come.
CAPCOM Okay, thank you.
CERNAN Jack, you might just as well go cold water, there's no more use for it now, if you're warm.
SCHMITT No, I'm not warm I'm just - want to hand me that other SEP there.
CERNAN Oh man, (laughter). Oh, the cover's open I wonder why it's hard to get up the ladder? Don't run it by.
SCHMITT What do we want these tongs on for.
CERNAN Give them to me. I'll take them down.
SCHMITT Just noticed them.
CERNAN Don't want them.
CERNAN Okay.
SCHMITT Thank you.
CERNAN Don't think about think about the cover, the cover's going to come open, that's about it.
SCHMITT Wait a minute.
CERNAN Got it?
SCHMITT I got it.

APOLLO 17 MISSION COMMENTARY 12/13/72 CST 00:36 GET 147:43 MC-593/3

CERNAN Probably got tongs on for the same reason I've got them on.

CAPCOM 17, we're ready for a grav measurement.

CERNAN It's here Bob. Just cleaning up the Rover getting our tongs out of the way.

CAPCOM Okay.

CERNAN For you information - for your information at this heading - the western most battery cover, like I talked about yesterday, is just starting to cover a just starting to cover the radiator.

CAPCOM Okay, we cover that - copy that.

CERNAN Oh, DUM DEE, DUM, DEE, DUM. You know I think its another a good day's work.

SCHMITT Uh huh.

CERNAN Okay, I dusted all that. I just knocked as hard as I could on my feet several times.

SCHMITT What you're going to say is you want me to brush you, huh.

CERNAN Well, let me keep this out of the way so it doesn't get dusty.

SCHMITT Okay.

CERNAN Boy, if I bumped it around that gravimeter is gonna distirb it like this.

SCHMITT Shouldn't.

SPEAKER Gotta do - well gotta do me first.

SPEAKER Yeah.

SCHMITT You're not nearly as dusty as you were yesterday, you're just dirty, that's all.

CERNAN Well.

SCHMITT I think I can get every thing off my shoes by banging, if you'll just get my arms. I didn't really fall in much today, except maybe my left arm.

CERNAN I tell you, we saw some of the things I think we saw today, we both fell in. (Laughter)

SCHMITT Oh.

CERNAN What, I hurt you.

SCHMITT Yeah, you're hitting.

CERNAN Well, you're right. Sorry. I don't have much control. (Laughter)

SCHMITT (Laughter) I know it.

CERNAN That reminds me of, that's dirty. There.

CERNAN I'm glad they can't see this. Ah, I stand out here and I look at that flag, and I look at the Rover, and I look at those feet. It's still hard to believe.

SCHMITT What deserve - we do, we do to deserve being out here.

CERNAN That's not very good. let me get your PLSS. Keep, - go forward just a little. There you go.

APOLLO 17 MISSION COMMENTARY 12/13/72 CST 00:36 GET 147:43 MC-593/4

SCHMITT Thank you.
CERNAN Sharp turn. Hey that fender is
really a classic. One might say it's a Young fender, I
just put it on.
SCHMITT Do we need, do we really need those
clamps? (garble)
CERNAN No, no. I can't think of anything
we need them for. That - That light - but you can tie
that light some where -
SCHMITT We don't - We might bring one back.
CERNAN Yeah. We ought to leave one in Tribune.
Dr. Young.
SCHMITT Still light soil. We stopped it.
CERNAN Huh.
SCHMITT (garble) - In a way that would ridd --

END OF TAPE

SCHMITT In a way that went radially down that crater. Let me turn and then take another look and then I'll - get up there. You've got quite a bit around your hoses here.

CERNAN My hoses.

SCHMITT Okay, And I don't know what I can do about it, Geno.

CERNAN Oh, just give it a swap in here.

SCHMITT Well I got - missed my turn. Let me get the top of your LCRU there.

SCHMITT I'm pretty good.

CERNAN Yeah, mine's good.

SCHMITT Okay, let me get to your front. I didn't get your other on.

CERNAN Okay. I don't know that I can.

SCHMITT It's the inside arm - I don't have anything on it.-

CERNAN No, that's right, you don't. It isn't - it's about the same.

SCHMITT When you fall out - you fall out on your other arm.

SCHMITT I've got there is some on that leg there.

CERNAN Okay. Don't know what I'm going to do about it.

SCHMITT I think we're just going to have to make do. Let me see what I can do with you. Just look at me.

CERNAN Look at this rock right here by thepad -

SCHMITT I don't know - did I just turn your comm? Do you still hear me?

CERNAN Yep. I've just been intending to mention that several times. Anybody that would land on a rock ought to have their head examined. Well where have you been GARBLE.

SCHMITT Oh, I played some games here around station 3. I'm sorry.

CERNAN Boy, oh, boy.

SCHMITT Unintentional.

CERNAN Whoo - but I - lot of your turns -

SCHMITT Hold your arm up.

CERNAN Lot of your turns GARBLE.

SCHMITT Yeah, I noticed that. On me.

CERNAN God dang that rock. If I was strong enough I'd move it. Hey, I am strong enough. That's one we ought to bring home.

SCHMITT Bob, we can't fill up the LM and everything else.

CERNAN That's about the size of the SRC. Get it up on the pad.

CERNAN Oh, shoot. First time that's happened.

SCHMITT Here, hold on to me. You know, by right, that should happen more. GARBLE and I want you to get up on the ladder sump. Oh, man let me get the back of your PLSS.

CERNAN What did you bump against? I guess that's from the Rover seat.

SCHMITT I think it is.

CERNAN No, I mean you got a couple of abrasions right on through the -

SCHMITT So do you. I wasn't going to mention them.

CERNAN Well, these are only a pin hole thick but all I can say is it's better than walking. Oh, man I'll tell you we covered over 20 kilometers today, Dave. You like to walk up and down those hills, and ditches at 20 kilometers.

SCHMITT Okay, can you turn towards me I want to get the front of your leg one time. Come back.

CAPCOM Okay, and 17, Houston - how's the dusting coming?

CERNAN I think you've had your day of dust in there.

CERNAN Well, we're almost there. I'm going to send the LMP in in about a minute.

CAPCOM Okay, we're getting to a point where we need to be inside in less than 10 minutes with the thing closed up.

CERNAN Yes sir, we're on our way, Bob. That takes care of it. Knock your feet off, Jack. Knock your feet off on the ladder.

SCHMITT Okay.

CAPCOM And don't forget the antenna, guys.

SCHMITT Okay, I need the GARBLE.

CERNAN Oh, Bob, you're a beauty. How did you think of that?

CAPCOM Don suggested it.

CERNAN Don who? He strikes again. Your GARBLE are sure because I wouldn't have seen it as I went up. As I took inventory with my book as I'll do here in a minute. Open battery covers taking care of dusting the crew. Mike is open 100 percent. They've been open 100 percent all day.

CAPCOM Okay.

SCHMITT If I can just get up here. Oh, shoot I forgot a map up there.

CERNAN Now, let's make sure we got all of those. I don't want to get hung up with any.

SCHMITT Here.

CERNAN I mean I forgot to put the antenna under this map, under the other thing.

SCHMITT It's a snap. Okay.

CERNAN Okay.

SCHMITT You're set.

CERNAN Okay, go on up Jack and I'm going to read the gravimeter findings at pallet before I go.

CERNAN Okay.

CAPCOM Okay, and Gene we don't think you've punched the grav reading yet.

CERNAN Yes I did Bob, I'm going to read it for you in a minute.

CAPCOM Okay.

CERNAN The reading is 670 023 501, that's 670 023 501.

CAPCOM Okay, we got that go to stand by. Open the cover and dust the radiator. It needs it. Or dust the radiator period.

CERNAN It's dusted all ready, I took care of that and I'm in stand by.

CAPCOM Okay, copy that.

CERNAN Okay, final check LRV blankets open, battery covers open, samples off. We checked under both seats. Equipment stowed. Okay, you're all clean to go in. Okay, dust SEP, blankets open verify power off - recorder off - TG that's red - that's where I dusted. Tidy the MESA blankets - they're okay. Okay, and I've got this box to bring up when I go. Okay, let's see - oh, man that's bright. No PLSS antenna - brush the ladder hook - EVA pallet to LMP - you got it? The pins are green and please stand by. Open GG thermal cover lid and dust - - that's done. Final check. We've got the pallet, EB is on the LM. New inventory, the S-IVB Mr. Parker and I guess you're happy we got them all.

CAPCOM Roger.

CERNAN SRC2 is in my hand and big bag is not required.

CAPCOM Roger that.

CAPCOM And we're ready to call you all in as you go to that.

CERNAN Okay, Jack's halfway through it now and I'm going on up the ladder.

CAPCOM Okay, copy that.

CERNAN Oh, my oh me. How you coming?

SCHMITT Just about there.

CERNAN That's a nice one he had at first step. God speed to crew of Apollo 17. I'm going to keep reading that. I like that message. How's Captain America, speaking of Apollo 17.

CAPCOM Captain America is sound asleep - just about to come around to AOS. We think he's sound asleep.

CERNAN Hey, how does that always happen? That happened yesterday.

CAPCOM He got up before noon this morning too.

CERNAN Oh, okay. Just take it easy Jack, it'll - here we go - this pen didn't work.

SCHMITT Nothing will work when your hands get tired that's the problem. Wasn't a bad day. How long we been out, Bob, of course we're still out.

CAPCOM 7 plus 27 so far.

CERNAN 7 plus 27.

CAPCOM How does that grab you.

APOLLO 17 MISSION COMMENTARY, 12/13/72, 00:46CST, 147:53GET, 594/4

CAPCOM Well we're getting anxious to get you in and
get your hatch closed.

CERNAN Well, we understand that. Jack's unloading
the pallet and as usual when it comes out I'll shove this stuff
in and we'll be gone.

END OF TAPE

SCHMITT Just takes a certain amount of time.
CAPCOM Okay, Gene, are the three SCB's inside
the hatch already?
CERNAN No - Bob, I don't think any of them are in-
side, let's see I've got -
SCHMITT No -
CERNAN I've got 8 here and 6 here and - and we
emptied the contents of 4 into the -
CAPCOM Roger.
CERNAN SRC and we emptied the contents of 5 into
one of these other two bags, so we've only got 2 of them here,
plus the SRC.
CAPCOM Roger that.
CERNAN That one and the sixth.
CAPCOM Roger that.
CERNAN And we've got 2 of them hanging on the tail
of the rover, and I don't know what's under Jack's seat right
now.
SCHMITT 7 is under my seat.
CAPCOM We copy that, don't worry about it.
SCHMITT One more battery, Geno, and it's yours.
CERNAN Okay.
SCHMITT You always used to stand and watch me
do this, anyway.
CERNAN Yeah, but we had some long EVAs at the Cape,
but -
SCHMITT There you go.
CERNAN Okay, just be careful of the - let me get up
there a little further. Careful of that hat. Getting to look
like a regular garbage dump down there.
SCHMITT Okay, ready?
SCHMITT Sorry, babe.
CERNAN It's all right.
CERNAN Now, this one's going to come open if we're
not careful. Let me see if I've got one more step to go up.
No I think that's the last one.
SCHMITT I'll just hold it here until you get it. I
could shove that in if I push it with the SRC.
CERNAN The cap will come open, be careful.
SCHMITT Okay, we got big silver box.
CERNAN Can you push on that a little bit?
SCHMITT Yep.
CERNAN Okay.
SCHMITT Okay, Bob you've got the 2 SR - 2 SCBs, I'll
push it in, SRC and there goes the ETB.
CAPCOM Copy that. Now how about a CDR?
CERNAN There's only one thing left - that's right,
that's the only thing left out here.
SCHMITT Are you on a checklist?
CERNAN No, I'm not even on my checklist, but I guess -
yeah I am, it says ingress. Let me knock some more dust off.
SCHMITT Okay, let me get behind the door.
CERNAN Well, I'm going to take what dust I got in
with me. Oh.
SCHMITT Push, there you go. Keep the button closed,
you're good. Beautiful, just float in. Hanging up a

SCHMITT little on the purse but that's all right.
There you go.
CERNAN Oh.
SCHMITT That's my arm I'm getting in the way, there.
Let get out of the way-
SCHMITT Let me just check that seal before we
close that.
CERNAN Can you get your arm off?
SCHMITT Okay.
CERNAN There's no big rocks in it that I can see,
lots of dust on the floor.
SCHMITT Yeah, I think it's okay. Okay, the hatch is
partially closed -
CERNAN -let me get it, I think it says to lock it
doesn't it?
SCHMITT Well we're supposed to close our water first.
CERNAN Okay, forward hatch closed and locked, dump
valve both AUTO, okay, confirm our water closed. Let me see if
I can't get that -
SCHMITT Well here, why don't I get yours and you get
mine.
CERNAN Okay, I just got mine.
SCHMITT If you turn I'll get yours.
CERNAN You'll have to put your slip in your right
arm high, stick it up high.
SCHMITT Wait a minute.
CERNAN No, I can't reach you Jack, unless you turn -
SCHMITT Don't move yet, don't turn around.
CERNAN Okay.
SCHMITT Move over to the corner. Okay. Be sure I
got the right one. Far right far left, secure oxygen.
CERNAN Okay. Your water's off.
SCHMITT Okay. Water's off.
CERNAN Now stay there and I'll lock the hatch.
SCHMITT I've got to get into position to do the other
good things. You go ahead.
CERNAN Do you have enough room or do I need to turn?
No, let me down. Now why can't -
SCHMITT Okay, let me turn back, get out of your way.
Got it?
CERNAN Okay, hatch is closed and locked.
CAPCOM Okay, and remember I think that the overhead
valve is OPEN.
SCHMITT That's right.
CERNAN Yeah, I have to move over, Jack, so I can
reach it.
CAPCOM And you ought to verify both, I guess.
CERNAN You'll have to wait then.
SCHMITT Can you reach it now?
CERNAN Okay.
SCHMITT No, you got to turn left you -
CERNAN Well, I'll have to -
SCHMITT Right

CERNAN I'll have to turn around then.
SCHMITT How's that, any better?
CERNAN No -
SCHMITT You've got to -
CERNAN - for some reason I can't put my PLSS toward
you.
SCHMITT No, you can't. Just face front, if you can
and it'll fall forward as you get it.
CERNAN Well if I get my - I'm going to have to go
all the way around, I guess.
SCHMITT Well just -
CERNAN Look, I've got to get this (garble) circuit
breaker -
SCHMITT Wait, I've got you just where I want you,
now stay right there, and shift your weight as far to the left
as you can.
CERNAN Okay, it's AUTO -
SCHMITT Okay.
CERNAN - and it's - and it's locked, okay?
SCHMITT All right.
CERNAN Now, cabin repress AUTO.
CERNAN Can't get it, I'll have to turn left here.
SCHMITT Now?
CERNAN Okay, let me turn left, no I can get it. Okay
cabin repress AUTO.
SCHMITT AUTO.
CERNAN And at 16 cabin repress breaker closed.
SCHMITT CLOSED.
CERNAN Master alarm and cabin warning lights. Cabin's
coming up, Bob .5.
CAPCOM Copy that.
SCHMITT I've still got 15 percent oxygen.
CERNAN Okay, cabin pressure's increasing (garble)
pressure rate in cabin.
SCHMITT (garble) cabin.
CERNAN Okay, and your PLSS O2 off at cabin pressure
25, it's there now, and crossed tubes.
CERNAN Mine's off.
SCHMITT Mine's off.
CERNAN Okay cabin pressure 35, cabin's up to 40.
CERNAN Okay, next thing Jack, you can start verifying
your white dots are out.
SCHMITT Okay.
PAO We mark the end of EVA at 148 hours 12 minutes
10 seconds. Total EVA duration 7 hours 37 minutes, 22 seconds.
CERNAN Okay, I'm good here, here, here.
CAPCOM And, 17, congratulations, that was 2 EVAs
and 1/2.

END OF TAPE

CAPCOM (garble)
CHALLENGER Thank you Robert, but until I get my helmet and gloves off, I won't say anything.
CHALLENGER Okay, Jack. ECS suit fan 2 closed. Suit fan Delta P closed.
CHALLENGER Closed.
CHALLENGER Okay, master alarm just came on. Okay, and the heaters MESA open. You can open your MESA heaters. We have a Master alarm, Houston. I don't know why.
CHALLENGER (garble)
CHALLENGER You did get suit fan no. 2 - -
CHALLENGER Suit fan Delta P sensor.
CHALLENGER Okay.
CHALLENGER You've got suit fan #2 and Delta P, Okay.
CHALLENGER MESA is open
CHALLENGER Okay that's why it came on, ECS caution water (garble) light components light should go out after that fan comes up. You can doff your glove.
CAPCOM Roger. We think that what happened
CHALLENGER Okay.
CHALLENGER Well, I never thought I'd wear my EV cover gloves through 2 EVAs.
CHALLENGER I forgot all about them
CHALLENGER No, I didn't. I thought about taking them off until I started chipping those boulders. And I'm glad I wore them.
CHALLENGER Yeah, I think it's a good idea.
CHALLENGER As hard as it is on your hands my - these cover gloves are just ripped to a nub. Glad it's not my gloves.
CHALLENGER Might consider taking them off tomorrow.
CAPCOM Roger. 17, talking about your cover gloves.
CHALLENGER Yeah, we're still wearing them Bob, and I swore I'd take them off after the drill, but, I used a bit of real-time common sense.
CAPCOM Okay.
CHALLENGER Okay, closure off.
CHALLENGER LMPs gloves are off.
CHALLENGER Need some help.
CHALLENGER Yeah.
CHALLENGER I can just about -
CHALLENGER No you went the other way.
CHALLENGER Did I go the wrong way?
CHALLENGER Yeah, I did.
CHALLENGER We'll try that one.

CHALLENGER No.
CHALLENGER Shouldn't have done that.
CHALLENGER Hey, you can come and get this.
CHALLENGER I am
CHALLENGER Yeah, I'm sorry.
CHALLENGER You get that one and I'll get these
two. Get that one.
CHALLENGER I'll get this one.
CHALLENGER I'll (garble) (garble) (laughter).
CHALLENGER Okay, let me try that one now.
CHALLENGER It wants to go.
CHALLENGER Let me try then.
CHALLENGER (garble) got it.
CHALLENGER Yeah.
CHALLENGER It's usually easier when you do it
yourself the angles wrong.
CHALLENGER Oh Boy. It's trying to get a little stiff.
Oh they came off now they came off, ooh ho, ho, ho, okay
doff helmets with visors. Now I'll get yours for you.
They're in my way.
CHALLENGER Yeah.
CHALLENGER I know how you feel.
CHALLENGER I don't know why they're so wet. I
don't know whether it's - they're just soaking wet.
CHALLENGER Everything is just twice as hard.
CHALLENGER Now comes the old hayfever again.
That went up and that went down. There went BRA, let's
get mine also.
CHALLENGER It feels good, now that these
things are off.
CHALLENGER Oh man, does that smell. Sure can
pick that up.
CHALLENGER Okay, you got yours?
CHALLENGER I've got mine.
CHALLENGER Okay, Bob. Now, helmets and gloves
are off.
CHALLENGER Pressure looks good still.
CHALLENGER Hello, Houston. Do you read?
CAPCOM Roger, 17. Read you loud and clear,
Challenger.
CHALLENGER Very good Robert. The helmets and
gloves are off.
CAPCOM Absolutely outstanding. (garble)
CHALLENGER Why don't you go home and get some sleep, Bob.
CAPCOM Absolutely outstanding. I can't
say anything more than that. And I mean it from the
bottom of my heart. From the bottom of my soul or something

CAPCOM that (garble)
CHALLENGER Thank you Bob.
CHALLENGER Well, it's all ours.
CHALLENGER Bob, it's all your good kindness and help.

CAPCOM 777 plus 37 from 3.5 to 3.5 -
CHALLENGER As mission scientists you're totally responsible.
CAPCOM And the back up crew says you are even better than outstanding.
CHALLENGER (Laughter) Well, thank you, we enjoyed it.

CAPCOM Hey, I'll turn you over to Little Joe here, while I go talk to some people. We've got 9-1/2 hour EVA scheduled for you tomorrow. We're planning to spend 2-1/2 hours extra over there at station 4.
CHALLENGER (Laughter). I hope those gloves that he's got packed in the back have got something in them. (Laughter). Ah, let's read the checklist. See if we can go to bed on time tonight.

CHALLENGER OH, man
CAPCOM That might be a change.
CHALLENGER I feel better than I did last night.
CAPCOM I'm going to turn you over to Joe.
CHALLENGER That didn't do very much good.
CAPCOM See you guys tomorrow.
CHALLENGER (garble) Okay.
CHALLENGER Verify safety on dump valve.
CHALLENGER Okay, Bob. Get some sleep. Huh.
CHALLENGER Yeah, I verified them both.
CHALLENGER Sorry, to be touchy, Occasionally.
CHALLENGER Descent water valve, open. Okay.
CHALLENGER Water valve's open.
CHALLENGER Okay, then you can take your purge valve off.

CHALLENGER Probably got a little dust in that tonight. Little stiffer. (garble) again.
CHALLENGER (garble) purge valves (garble) disconnect OPS hoses.
CHALLENGER Ah, man, that is dusty.
CHALLENGER Yeah, let's - let me disconnect yours, you disconnect mine. It's easier to do it - I think I can get -

CHALLENGER Would you get the OPS hoses.
CHALLENGER Yeah. Okay, whatever it says.
CHALLENGER Yeah.
CHALLENGER Disconnect OPS hose.
CHALLENGER Is that what it says?
CHALLENGER Yeah.

CHALLENGER (garble) my fingers in here a little
bit better.
CHALLENGER They are all showing a little bit (garble)
CHALLENGER Mine were in this in pairs.
CHALLENGER (garble) harder to fit.
CHALLENGER Yeah.
CHALLENGER Okay.
CHALLENGER There, you're disconnected.
CHALLENGER valve seat gate diverter valve to horizontal.
CHALLENGER Okay. Horizontal.
CHALLENGER And suit ISO both the two to flow.
CHALLENGER We don't have the LM hoses on so don't - but
mine is too slow to get some air in here. Yeah.
CHALLENGER Sure is some dust.
CHALLENGER Waste pump off and (garble) off
CHALLENGER Good.
CHALLENGER Man, that's hot, feel that.
CHALLENGER Out in the sun.
CHALLENGER Yeah.
CHALLENGER Hooks off. Hands off.
CHALLENGER Okay.
CHALLENGER (garble) disconnect PLSS H20 from
PGA.
CHALLENGER Okay.
CHALLENGER Disconnect LM water, that's what we
want.
CHALLENGER (Garble)
CHALLENGER Yeah.

END OF TAPE

CHALLENGER And the ENO flag.
CHALLENGER Yeah.
CHALLENGER I got a little water - water hose here.
CHALLENGER That (garble) is complex, there.
CAPCOM That's perfectly fine.
CHALLENGER That was easier this time.
CHALLENGER It had to be.
CHALLENGER Smells like someone's been firing a
carbine in here.
CHALLENGER I'm just standing here pushing that -
CHALLENGER Hot breaker.
CHALLENGER When you get it.
CHALLENGER Hey, little Joe. Are you there?
CAPCOM 17, this is Houston. And -
CHALLENGER Little Joe, are you there?
CAPCOM Roger. How do you read Houston? Over.
CHALLENGER Joe, we're reading you loud and clear.
We're - the left hand column and we're both going PLSS mode
to 0 and we'll be off the air for a scoosh.
CAPCOM Roger, Gene-o. I've been following you
real close and you two are mighty smooth. Boy, was that
nice today.
CHALLENGER (garble) that is.
CHALLENGER Yeah, the whole thing.
PAO Astronaut Joe Allen has come on to
relieve Astronaut, Bob Parker, at CAPCOM. We're in the
midst of a shift handover here in Mission Control. Flight
director, Gene Kranz and his team relieving the Pete Frank
team. We anticipate the change of shift press briefing will
begin at about one thirty A. M. in the MSC News Center briefing
room.
CHALLENGER Okay, Joe, LMP's PLSS is getting 02.
CAPCOM Thank you.
PAO This is Apollo Control at 148 hours
31 minutes. The participants have left for the news center.
And we anticipate the change of shift press briefing will
begin in the next 5 or 10 minutes in Building 1. At the present
time the CSM with Ron Evans aboard sleeping is passing over
the landing site. That second EVA ended at 148 hours
12 minutes 10 seconds with a total duration of 7 hours
37 minutes 22 seconds. And at present time the LM crew is
in the process of getting the - getting out of their suits.
They'll begin doing that shortly and then getting the LM
cabin reconfigured and ready for their sleep period. And in
the control center, tonight, while the crew is asleep, we'll
be making plans for the third 7 hour EVA scheduled for
tomorrow.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/13/72 01:26 VST 148:33 GET MC-598/1

CHALLENGER Hey - hey Joe, this is Gene.

CAPCOM Go ahead.

CHALLENGER Hey, Challenger's been holding at about 5.5 every since we got in here. You all happy with that?

CAPCOM Looks good to us, Geno. We've been watching it and everyone's happy down here.

CHALLENGER Okay, well this morning when we were getting ready we started at 5.5 and prior to that it's been at 5.0 all the time. Just so we're not venting anything that's all.

CAPCOM Geno, we here you on that and we'll be watching it.

CHALLENGER Joe, we're about 2 minutes into the CDR's 02 charge.

CAPCOM Thank you.

CHALLENGER Joe, LMP has 96 percent on his guage.

CAPCOM Thank you, Jack, we copy that.

CAPCOM Geno with regard to your observation made to us a few moments ago, I guess we will ask for the cabin return to the AUTO position and your suit diverter valve to CABIN please. We are about 2/10ths of a psi from cabin release, over.

CHALLENGER Okay, we're getting that now.

CHALLENGER Joe, CDR's reading 94 percent on the 02 charge.

CAPCOM Thank you.

PAO This is Apollo Control at 148 hours 41 minutes. The Change of Shift Press Conference is ready to begin at this time, we'll take down the live air-to-ground release lines, record any conversation with the crew for play back following the press conference.

END OF TAPE

PAO This is Apollo Control at 149 hours 11 minutes. During the change of shift press briefing the major activity aboard Challenger on the lunar surface and here in mission control has been to get the spacecraft in the proper configuration for the crew to begin their eight hour sleep period. The crew reported and we confirmed through telemetry here on the ground that the spacecraft cabin pressure had come up just a little bit above what we would normally expect - normally runs around 5 pounds per square inch. And we're seeing a pressure of about 3/4 of a pound higher than that about 5.73 pounds per square inch. This is not particularly unusual. We did see a pressure rise following repressurization after the first EVA where the cabin pressure came up somewhat above normal. The pressure relief valve in the cabin would operate at about 5.83 pounds per square inch. In the taped conversations with the crew that we obtained during the change of shift briefing, you'll hear some conversation about the cabin pressure and some instructions to the crew to have them looking for any sources in the cabin that might be putting extra oxygen into the cabin such as the PLSS fill valves that might not have been closed fully or something like that. At this point the cabin pressure has stabilized it looks like and we've found nothing amiss. We'll replay the tape conversation for you and then standby live.

CHALLENGER Okay, Joe, LMP's OPS pressure is 6300.
CAPCOM Thank you.
CHALLENGER Commander's OPS pressure is 6100.
CAPCOM Copy 6100.
CHALLENGER Say Joe our cabin pressure is riding even higher now about 57.
CAPCOM We copy that.
CHALLENGER Joe, Joe we had the commander's hoses stowed at his suit flow - that might have done it. Is that right?
CAPCOM Sounds very possible, Jack. We'll look at it a little more here.
CAPCOM Challenger, this is Houston requesting you move your demand regs A and B to egress please.
CHALLENGER They're egressed.
CAPCOM Okay. 17, Houston. We noted down here that your suit diverters went to egress and we want the demand regs to the egress position, please.
CHALLENGER That's right but the suit gas converter extends when you go to -
CAPCOM You're right again.
CHALLENGER Houston do you figure where we're leading?
CAPCOM Jack, we don't think so. It looks like you're pretty steady between 55 and 56 and we're watching it very closely however.
CHALLENGER Okay, you know when we had that problem this morning I hope the backflow did not hurt something when I had the LMP hoses stowed in the iso valve in suit flow.

CAPCOM Jack, just for your information we saw about the same thing last night. The only difference was the pressure didn't climb quite so high so we think whatever it is it really doesn't involve problems - the small problem you had this morning.

CHALLENGER Okay, Joe.

CHALLENGER Okay, Joe we've got the commander's PLSS back in the recharge station. We got a new battery in it. Odd numbers - and a new canister in it and we're working on Jack's right now.

CAPCOM Okay, Gene, sounds good.

CAPCOM 17, Houston.

CHALLENGER Go ahead, Joe.

CAPCOM We're still watching your cabin pressure down here. Could you check for us, please, if the PLSS fill valve is securely closed.

CHALLENGER Yes, it was closed.

CAPCOM Okay.

CHALLENGER Joe you want me to check out the regulator?

CAPCOM Stand by.

CHALLENGER And Houston, Challenger, you want me to check this? Okay, ED vats are 37.2.

CAPCOM Copy that.

CHALLENGER PCM is going high. Let me know when you're ready for the battery management.

CAPCOM Roger.

CAPCOM 17, Houston. Standby on the battery management for a few minutes please and in the meantime could you check the low pressure PLSS fill valve closed, please. Over.

CHALLENGER Joe, I checked that. It's closed.

CAPCOM Thank you.

CHALLENGER Houston, Challenger.

CAPCOM Go ahead.

CHALLENGER Yeah, does your telemetry and R gage come off the same telemetry on that - same transistor?

CAPCOM That's affirm. It does. And Challenger, we've got a communications problem at one of the sites and we're going to ask you to go to panel twelve and turn the power amplifier to primary, please.

CHALLENGER Okay, it's primary.

CAPCOM And Challenger, we're ready for battery management at your convenience.

CHALLENGER Okay, stand by.

CHALLENGER Hey, Joe.

CAPCOM Go ahead.

CHALLENGER Okay, this is Geno, I just dug a rock out of my pocket - no one back there probably remembers but when we were at Shorty, fumbling around trying to get everything done I said there was a piece of very shiny flat glass like looking material that reminded me of obsidian well it's not - it looks like a very fine gray rock but it's a fractured piece and it looks like its - I picked up

a fractures of about 3 or 4 vesicle faces on it - the vesicle faces are very shiny. That's what reflections caught my eye. I think the unique part about it is - Jack may want to say something else about it. The unique part about it is I picked it up at Shorty. I documented halfway between the rover and where we were sampling that orange stuff and it will be in bag 12 Echo.

CAPCOM Okay, Geno, copy 12 Echo and I was assured by the folks here when I came in -

CHALLENGER That'll go in it.

CAPCOM that you did indeed have a shiny sample of some kind in your pocket and would probably find it later on. So they called that one. Could you turn off the power amplifier for us, please.

CHALLENGER Okay, we'll put it in SCB A.

CAPCOM Okay, go ahead.

CHALLENGER Okay, it's off and we'll put that rock in that sample bag and put in SCBA. Joe, this rock looks very much like 12008 - 12008. It's a fine grained - coarsely - very coarsely vesicular gray rock, probably basaltic.

CAPCOM Okay, Jack, real fine. We want low bit rate power amplifier OFF in low bit rate and we can maybe label that one 17008. How's that sound?

END OF TAPE

CAPCOM 31 08, how does that sound?
CHALLENGER No, you've got to lable that, Gene, rock.
I was going to tell you those other things but I thought I'd let Jack.

CAPCOM Okay, Thank you.
CHALLENGER The vesicles, if I may project the size of them probably were up to 4 or 5 centimeters in diameter. They're irregular shape but they're clearly vesicles that look like they're lined with either glass or very fine grained crystal. They're very shiny.

CAPCOM Roger.
CHALLENGER And for our next act -
CAPCOM Jack, we're going to ask for your next act, that you check for us both PLSS valves OFF and both OPS valves OFF.

CHALLENGER Joe, they're both verified off.
CAPCOM Okay, Jack. We understand that all 4 valves are verified off.

CHALLENGER That's affirm, Joe.
CAPCOM Okay, thank you. I'm sure you realize that we're still showing that pressure increasing very, very slowly and are pretty well convinced that nothing's leaking in from the outside so we're looking around on the inside here.

CHALLENGER Joe, is our oxygen consumption abnormal at this point.

CAPCOM No, not at all, Geno. Everything looks pretty normal except this slow creep in the cabin pressure.

CHALLENGER I guess the possibility is a creeping REG or a transducer, is that right?

CAPCOM Yeah, either that or it may be we're just watching some of the affects of the thermal shock that your tanks took when - from the repress itself. We're not worried about it at all, but we're still watching it.

CHALLENGER Joe, we might make a note that my 2 add BP area samples went into bag 8 also.

CAPCOM Roger, Jack. That's noted.
CHALLENGER Joe, I've got some numbers if you'd like them.

CAPCOM Go ahead.
CHALLENGER SRC is 41.5, BAG 6 is 24, BAG 8 is

35.
CAPCOM Copy 41.5 and 24 in Bag 6, 35 for BAG 8.
CHALLENGER That's it. Joe how many samples did we get today?

CAPCOM Stand by.
CHALLENGER Don't start a big investigation, I was just curious.

CAPCOM Let me ask around, Gene. Well see in a minute.

CAPCOM 17, we think you have 54 samples from this EVA plus some coarse.
CHALLENGER Thank you Joe, just curious.
CAPCOM That's not half bad.
CAPCOM And -
CHALLENGER Okay, Joe. We're on 5-5 and I'm going to start doffing.
CAPCOM Okay, Geno, copy 5-5 and before you get started there, would you put both the DEMAND REGS to close please, as we continue to watch this pressure.
CHALLENGER Okay, Joe. DEMAND REG A going closed. The DEMAND REG B going closed.
CAPCOM Thank you. And we verify them both closed.

PAO This is Apollo Control, that completes our tape playback. We're standing by live now. And the LM Cabin pressure reading at this time 5.77 pounds per square inch. There's no particular concern over the higher than normal cabin pressure. However, it is something we don't understand at the present time. Now, there are a number of limited sources of oxygen that can be getting into the cabin to raise the pressure. And, as Joe Allen mentioned to the crew, there's not much chance that anything is leaking in from the outside. We've been systematically checking 1 by 1 the potential sources of the oxygen flow into the cabin. And at some point, if all of the potential sources are eliminated, we begin to reach the conclusion that perhaps the sensor is at fault. However, at this point, it's not possible to say what the - what the cause of the slightly higher than normal LM cabin and pressure is.

CAPCOM 17, this is Houston. We'd like the suit diverter back to cabin, please.
CHALLENGER Cabin.
CAPCOM Okay.

END OF TAPE

CAPCOM Cabin press is dropping down very slowly now so we think we've got a time leak in one of the cabin regulators, one of the demand regulators and we'll run a check after you get squared away there a little better.

CHALLENGER Okay, Joe, we'll be at your beck and call.

CAPCOM I'll always smile at that.

PAO The demand regulators which Joe Allen was describing to the crew and suggesting that they might be the source of the small oxygen leak into the cabin are used to control the flow of oxygen from the storage tanks in the lunar module to the cabin. The procedure that we're going to follow here is to let the cabin pressure continue to drop. It's come down from 5. - from a high of 5.81 pounds per square inch to 5.73 and we're going to let it get down a little closer to 5 pounds and then run some checks to determine which of the two regulators is leaking. The procedure after this was determined - after this is determined would be to simply use the good regulator and turn off the regulator which has the small leak.

CHALLENGER Houston, Challenger.

CAPCOM Go ahead.

CHALLENGER Joe, we're going to air out the suits, we're going to go to suit flow on the commanders' ISO valve now.

CAPCOM All righty.

CHALLENGER Say again.

CAPCOM That sounds good.

PAO This is Apollo Control. The crew aboard Challenger, Gene Cernan and Jack Schmitt running about 2 hours behind in their presleep preparations at this time. And, we do expect to give them a full 8 hour rest period, which would mean that we will have a slip in the start of EVA 3, probably somewhere an hour and 2 hours. We won't be able to pin that exact start time down until sometime after the crew has gotten to sleep, and we see how their sleep period is working out, but again 1 to 2 hours delay in the start of EVA 3 looks likely at this time.

END OF TAPE

SCHMITT Joe, I guess you guys are tired of looking at my heart beat so I going to tury the biomed off as I get out of my suit.

CAPCOM Okay, Jack.

CERNAN Hey, Joe, this is Geno, how do you read me?

CAPCOM Geno, you're five by.

CERNAN Okay, we're going to get Jack out of his suit. I'll be monitor.

CAPCOM Roger. From the way the 2 of you worked today I'd think you could just about turn him upside down and pour him out.

CERNAN Yeah, if he'd slip through that little hole at the end of his wrist.

SCHMITT Joe, the day they can pour me out of any thing they'll call me slim. Talk to you later.

CAPCOM Okay. Among other things.

CERNAN Remember those nice white suits.

CAPCOM The clean room will never be the same again.

CERNAN You'd never believe it.

CAPCOM Challenger, this is Houston.

CERNAN Go ahead, Houston, Challenger here.

CAPCOM Geno, we're going to start to investigate which of your demand regulators is leaking and we're going to ask you to put DEMAND REG ALPHA to cabin now and as we watch it please do not make any urine dumps. Over.

CERNAN Okay, we will not make any urine dumps and we'll go to cabin now. Okay, ALPHA's in cabin and we'll be ready for your debriefing here in about 5 minutes.

CAPCOM Okay, Geno, and it's going to be a short one.

PAO This is Apollo Control at 150 hours 20 minutes. We're looking at a LM cabin pressure now of between 5 point 61 and 5 point 65 and you heard CAPCOM, Joe Allen, instruct the crew to turn back on one of the cabin oxygen regulators which supplies O2 to the cabin from the storage tanks. REG A is the one that's on line right now. we'll watch the cabin pressure and see if it begins to rise again, and if so we would conclude that Regulator A has a small leak. However, if nothing happens we'll then turn Regulator A off and turn REG, Regulator B, on and watch it to see if the cabin pressure begin to go up with that regulator. The LM Environmental Systems Officer made one point to Flight Director, Gene Kranz, and that is that very very small amounts of additional gas in the cabin will show up in our telemetry readings. Now, we're talking about tenths to hundreths of a pound per square inch of pressure and there are a number of possible things at the end of an EVA that could contribute to this kind of a pressure rise, such things as moisture in the suits when the suits are

PAO removed, evaporating carbon dioxide or the temperature rise, small temperature rises, in the cabin due to the heat stored in the rocks brought in. All of these things could have contributed to causing the pressure rise that we saw and it may well turn out that neither of the regulators has any problem. In the event that there is a small leak in one of the two regulators the Lunar Module functions perfectly well, the cabin atmosphere would be maintained perfectly well with one regulator and the procedure would be to simply shut down the regulator that was leaking. It, of course, could be brought back on line if needed and would perform its function. And it still appears that we are approximately 2 hours behind in getting the crew ready for their sleep period. We have a clock in the control center counting down to our best estimate at this time as to when the sleep period will begin and it now shows 2 hours 36 minutes.

END OF TAPE

CHALLENGER Okay, Houston, we're going down voice backup.
CAPCOM Stand by on that.
CHALLENGER Okay, we are ready for your EVA-2 debriefing.
CAPCOM Okay, 17. To begin with, we want you to delete that step going to down voice backup, and I've got a surface block data to read up to you. A few minor changes in your lunar surface checklist. And a couple of very quick questions for the debriefing when you're ready. Over.
CHALLENGER Go ahead in the stated order.
CAPCOM Roger. Moving right along now to the surface block data lift off time, T-33, 152 plus 30 plus 01; T-34, 154 plus 28 plus 33; T-35, 156 plus 27 plus 05; T-36, 158 plus 25 plus 37; T-37, 160 plus 24 plus 09, Over.
CHALLENGER Okay, Joe. Starting with 33. 152 3001 154 2833 156 2705 158 2537 160 2409, and what's our present REV?
CAPCOM REV 32, Jack.
CHALLENGER Hey, Joe, for sanity purposes what day is this?
CAPCOM We've checked around the room here and the consensus is it's Wednesday morning. Over.
CHALLENGER Oh, okay. I really wanted to know whether it was (garble) ham or frankfurter morning and I guess we can work that out.
CAPCOM Roger, Gene. Apparently the surgeon is happy with either of those days and we want you to turn to - right now to 5-7 in the checklist and perform that - one particular step at 150 hours which will prevent the computer clock from overflowing and that's proceed VERB 37 enter 06 enter proceed SEP. We'll stand by for that. Give us a mark as you start it. Over.
CHALLENGER Okay, we're starting PRO. Proceed. VERB 37 enter. VERB 30 - Okay, Joe, you don't want me to go on the VERB - you're not going to give us an update, huh?
CAPCOM No update required. That was just to prevent an overflow. And then I'm ready for the quick changes in the lunar surface checklist when you are.
CHALLENGER Okay, Joe, go ahead.
CAPCOM Okay. Begin by putting the demand REG Bravo to cabin position and leave the demand REG Alfa in the cabin position where it now is. And I'll continue on with the changes in the checklist here, page 5-6, left hand side, where it reads configure ETB, the - the 4th line down that's starts out 4 B and W mag, they should read, Hotel India, Juliet and Romeo in LCG compartment. Then going up to the right hand side under stow in ETB, change the line 1 B&W mag Romeo to read 1 B&W mag Kelo Over.
CHALLENGER Okay, Joe, I changed the mags in the empty from 0 to Romeo and the mag in stow from Romeo to Kelo.

CAPCOM Okay, that sounds like the thing to do and a note on your demand regulators, we're showing that the demand regulator Alfa is - has good integrity and we're now in the process of checking the demand regulator Bravo. I've got a couple of fairly quick questions here when you're ready for those.

CHALLENGER Okay, Joe go ahead with your questions and integrity is certainly what we need around here, right?

CAPCOM Okay. Jack, a question for you to begin with. Is your gold visor sticking half way down apparently that's based on a discussion earlier, Over.

CHALLENGER Yeah. Apparently his visor is sticking.

CHALLENGER Which one? The gold visor?

CHALLENGER No, he said his sunshade is sticking half way down but the gold visor's not.

CAPCOM Okay, that answers the question. We couldn't tell from the TV whether it was the visor or the sunshade. That's fine. We also heard some discussion about possible wear in the seats of the suits when you were dusting each other off. We want to know if you could see the - any hint of the aluminum layers showing through in the suits. Over.

CHALLENGER No, Joe. Not to worry. Just a few scars on the PLSS thermal blanket in back where you probably rub the seat when you get in. Nothing on the suits.

CAPCOM Okay, Geneo. Now 2 real quick geology questions, that will help us do the plans for your EVA tomorrow. The first one has to do with station 4 and you called out some material on the Rim there - the crater at station 4 which looked like bedded spatter, and we're wondering if that resembled things that you'd seen in Hawaii. Over.

CHALLENGER Hey, Joe, I think they misheard. I think I may have said shattered and you might of said - thought spattered. No, I didn't - neither one of us intended to leave that impression. The rock - the big rock we sampled was - looked like shattered intensely shattered gabbro such as we've had around the LM. The rocks probably more significantly than Gene - one of which Gene picked up with the fine grain vesicular basalts - partially vesicular basalts. And we didn't have enough time to really examine the interrelationships of those rock types there but those were the two fragment types we saw.

CAPCOM Okay, Jack. That's quite clear to us now. Also a question about station 4 -

CHALLENGER Joe, -

CAPCOM Okay, go ahead.

CHALLENGER The bottom of that crater now had material that was extremely disorganized and it's aspect -

END OF TAPE

SCHMITT The bottom of that crater, now, had material that was extremely disorganized in its aspect and, really, we didn't have time to examine it in detail in order to decide why it was disorganized. It did not necessarily look like the boulder that we sampled at the rim.

CAPCOM Okay, Jack, understand that. A question about the boulder you sampled at the rim. Would you compare the basalt in this boulder to - which you may have called a gabbro - I'm not sure in any case the basalt - to samples which you collected at Camelot and at ALSEP. Over.

SCHMITT Well, my impression was that they were the same rock type.

CAPCOM Okay, that's our impression, too. Thank you. That's it for us on the questions and for information, we're showing your cabin pressure is holding fairly steady even with both those demand REGs on.

CERNAN Okay. Keep watching it for us, will you, and let us know. I expect one of them is probably leaking pretty slow.

CAPCOM You have no worry about that Gene. We're looking at it real close.

CERNAN How's America looking to you?

CAPCOM It is just as clean as a whistle.

CERNAN It may not be when we get back there, judging from the looks of us. That's good to hear, though, it's a good bird. So is this one.

SCHMITT Joe, is there any - do you have any more debriefing questions?

CAPCOM Negative, Jack, and we're interested that you move right along so we can get you - get you turned in there and get some rest.

SCHMITT We're moving. We're eating now. We're feeling the same way, I think.

CAPCOM Troops, enjoy your meal there, and at your convenience you can go ahead with the feedwater recharge. We want you to hold off on the oxygen recharge until we watch these regs for about another 10 minutes. And give us a mark if you do start the water recharge, please. Over.

CERNAN Okay.

CAPCOM And, if there are any ways we can cut corners on the time here, it'll be helping us because we're still looking at it as being down a couple of hours nearly.

CERNAN Okay, Joe, we're working at it as fast as we can. Best place in the world to make it up is tomorrow night.

CAPCOM Right, Gene-o, and actually, we're going to pick up a good one shortly because we're coming up to a pad in the timeline. So, as long as we don't waste too much time, we're doing pretty well.

CERNAN Okay, be assured we're not. There's a certain amount of housekeeping we have to do but, very seriously, day after tomorrow is a very short day and I think we ought to look at making up any time. I'm a hold-faster on sleep periods but tomorrow is the one which I think is selectable.

APOLLO 17 MISSION COMMENTARY 12/13/72 GET 150:38 CST 0331 MC 604/2

CAPCOM Roger, we hear you.

SCHMITT Hey, Joe, this is Jack. We're eating here. Won't be too long at it, but if you've got any significant news or anything, why don't you give it to us?

CAPCOM Jack, I don't know if it's significant news but at least I know you will be interested. Both your demand rates look good now. We show no evidence of a leak there and it may have been that just recycling them reseated them, and solved whatever problem we had. You can go ahead with the O2 recharge on the PLSS and the water recharge at your convenience, and let me poll the room here for other news items. Over.

CERNAN Okay, Joe, we're starting our O2 charge on the CDR's PLSS, 10 minutes.

CAPCOM Okay.

END OF TAPE

CAPCOM Challenger, this is Houston.

CHALLENGER Go ahead, Joe.

CAPCOM Roger, this is a news report to eat by.

I'll combine an orbital science report with a sports report, an unusual combination here. I'll start out with a sports report on Monday night football, which you may not have heard yet; Joe Namath tried mightily to lead the New York Jets into the American Football League playoffs but the Oakland Raiders grounded the Jets in a 4th quarter 24 to 16 blitz. Namath passed for more than 400 yards but in spite of it, New York scored only 1 touchdown. Moving along to the successes of Captain America I'll rundown different items in the SIMBAY here. Beginning with the UV spectrometer, in general the data has been excellent. We're getting indications that the hydrogen atmosphere of the Moon is much less than expected - in fact, I don't think we're detecting any but rather setting a limit on the amount of hydrogen around the Moon. There was an Aerobee launch - or an attempt at an Aerobee launch - from White Sands on Monday to calibrate solar UV radiation but this launch failed because an instrument viewing port in the rocket failed to open. A second launch - let's see - was scheduled, I think, for today and I don't know whether that was successful or not. I guess it will be launched later today. The infrared scanning radiometer is performing beautifully. Indications are that subsolar point surface temperatures are higher than we've detected from our Earth based observations before. We're seeing many thermal anomalies, particularly in Procellarum and in the Procellarum area west of Copernicus. And, we're seeing also a few unusual cold spots which apparently are indicating areas of very fine soil with a few or no blocks in and on the soil. The Lunar Sounder Data is beautiful and the power monitor signals we find correlate with the surface features. And, the HF data indicates to us that we are detecting a variety of layers in the Mare area.

CHALLENGER Joe, this is Jack. Do you know where specifically they're seeing the hot spots west of Copernicus?

CAPCOM Jack, I don't have it on the page in front of me here. We're going to check into it and I'll get back to you in a second.

CAPCOM Jack, this is Houston. With regard to your questions on the hot spot, apparently they've not yet indexed the - these warmer sources that they're detecting to the CSM (garbled) and so they don't know exactly what they correspond to as far as the surface features themselves go. So, I can't help you on that right now.

CHALLENGER Okay, Joe. Just curious.

CAPCOM And, Jack, (garbled) handed me some numbers which I think you will be interested in. From the EVA 2 EMU summary the elapsed EVA time was 7 hours plus 37 minutes plus 22 seconds for a new outdoor record under

CAPCOM (continued) international rules. The rest of the sheet looks free from problems in a comforting way. Let's see, average metabolic rates, for you, Geno, 855 and Jack, you're running at around 920. That, relative to premission averages of around 850 - and you have a grand total EVA time now of 14 hours 49 minutes and 35 seconds.

CHALLENGER Very interesting numbers, Joe. Do you have any idea how the metabolic rate compared to yesterday?

CAPCOM Good question, let me ask on that one. Yesterday you were running at 1045 and 1090 so you're down considerably from your work rates of yesterday, which is good news. Maybe you're learning how to do it more easily or something like that.

CHALLENGER Yeah, but we spent a lot of time riding today and a lot of time working yesterday.

CAPCOM That's true. But, I guess that's not taken into the consideration of the average here. Certainly true - we can ask for the metabolic rate of the Rover. I'll bet that is pretty impressive for today.

CHALLENGER Well, don't get me wrong, driving that Rover is fine, but I'll tell you, it keeps your attention.

CAPCOM I'm sure it does.

CHALLENGER It keeps your passenger's attention, too.

CAPCOM I'm sure it does. We noted from comments when you were rolling along today - reading between the lines from time to time.

CHALLENGER Actually, Joe, for good long periods on at the run up to station 2, except when we had to pick our way up the hole in the wall, I was running at full bore at anywhere from, I guess, what did I say, 10 to 12 to 15 clicks - I didn't hit 15 going up very much. Coming down I did, but its really a standby for turn and watch where you're going type of run, because the small craters, of course, are the ones that can really jolt you. But the trouble is, you can't - you can never see what's just over the next ridge and the next ridge may be 20 meters away and you just can't see it until you're there and you don't know whether its a dish crater or pit crater.

CAPCOM Roger, Gene. We copy that.

CHALLENGER Joe, that-

CAPCOM Go ahead.

CHALLENGER That description - that description fits the geology up in there because we weren't seeing blocky rim craters and otherwise you would have been able to tell more easily about the old versus new craters which would be the ones you could either go through or not go through respectively.

CAPCOM Roger.

CHALLENGER That's a super machine to drive though, Joe, I'll tell you. If you had enough time you could really learn to take it all the way but you don't really do that just the second time around.

APOLLO 17 MISSION COMMENTARY 12/13/72 03:44 CST 150:51 GET MC605/3

CAPCOM Geno, was it spraying dirt at you today? Did you notice that you still missed the real fender and that the patch fender wasn't quite doing what maybe it could?

CHALLENGER No sir, I don't think we missed it at all. Fact is, we're recommending a design change, Joe.

CAPCOM That will be for next year's model.

CAHLENGER That's right.

END OF TAPE

CHALLENGER Hey, Joe is it all right to use the waste management system?

CAPCOM Rog, we're happy with those demand regs now, and you can proceed on with that and including all the PLSS recharges that you need to do as well.

CHALLENGER Joe, we're filling my PLSS with water now, you might check on the water quantity.

CAPCOM Roger, thank you.

CHALLENGER Joe, that should take care of my PLSS for tonight.

CAPCOM Okay, Gene, thank you. Out of curiosity, have you packed - or are you packing the ETB now?

CHALLENGER Yeah, Jack's doing it right now.

CAPCOM Okay, we've got a last minute change. We show that your mag Bravo is at about 77 frames and we would like for you to just leave it in the ETB, it's already in the ETB and take it out with you tomorrow. We can shoot up the remaining frames if we run out of film otherwise.

CHALLENGER Okay, fine. That goes along with our thinking.

CAPCOM You know apparently you made some comment earlier in the day about being bothered by comm noise during your egress from Challenger, did that go away right away or did it just cease to bother you or what - what was the story on that?

CHALLENGER I don't remember, so it must have gone away because the comm was great.

CAPCOM Okay, that's what we kind of assumed.

CHALLENGER Okay, we're charging Jack's PLSS with oxygen.

CAPCOM Sounds good.

CHALLENGER Houston, Challenger, the O2 is complete on the - O2 fill is complete on the LMPs PLSS and we're working on the water.

CAPCOM Roger.

CAPCOM Challenger, for information, we're coming up on a comm handover in about 1 minute and a half.

CHALLENGER Okay.

END OF TAPE

PAO This is Apollo Control at 151 hours 46 minutes. Jack Schmitt and Gene Cernan appear to be completing the last few items on the checklist before getting to sleep. We hope to get them to bed within an hour or maybe even a bit less, which would put them about an hour behind the nominal flight plan. Ron Evans aboard America is now in his 33 revolution of the Moon. That spacecraft currently in an orbit 69.3 by 53.6 nautical miles. Evans began an 8 hour sleep period at 146 hours 40 minutes ground elapsed time, which is right on the flight plan. And he's scheduled to end that sleep period at 154 hours 40 minutes. The pan camera - mapping camera, and laser altimeter in the CSM scientific instrument module bay, have been turned off. The infrared scanning radiometer - the ultraviolet spectrometer are both in the operating mode during the sleep period. And data indicates nominal performance for both.

CHALLENGER LMP's PLSS is charged.

CAPCOM We copy it.

CHALLENGER Joe, how has the weather gotten down there? Any better?

CAPCOM Geno, the weather is better. We were really socked in yesterday, as the fronts moved on through the Houston area. And it's cold and clear tonight, I suspect. It's been a while since we've been out, but they're calling for it to go down right near freezing.

CHALLENGER Okay, thank you.

END OF TAPE

CHALLENGER Hey, Joe, Challenger.

CAPCOM Go ahead.

CHALLENGER Hey, succeeded leveling the gravimeter yet?

CAPCOM Jack, we'll check it. Update our information on that. My understanding at the moment is that they've not, but they're thinking that the unit's just too cold and during the process of warming it up by dumping heat into it by running some of the equipment around it in it, and they by no means given up - given up hope for that unit.

CHALLENGER I figure that means that my fooling around with it didn't help them.

CAPCOM Apparently it didn't do too much for them, but what it did do was convince them that probably somehow locked up because it's temperature's not right yet. But they're not worrying about whether it's level or not level now. They're confident that it's been set up okay. And now they're just biding their time to bring that temperature up. We'll get some more words to you sometime tomorrow on it as you make your traditional visit to the site again - ALSEP site again probably. How are you coming along with your sleep prep?

CHALLENGER Ah, just about there, Joe. We picked up some time somewhere in here. Couldn't be much more than an hour behind.

CAPCOM No, that's just about right. You're looking pretty good on that. You get to sleep in the next 5 minutes, you're 1 hour behind.

CHALLENGER Yes sir, I'm putting my hammock up now as a matter of fact. What are you doing up so late?

CAPCOM Well, somebody's got to sit up and keep you guys honest. I think we're getting more sleep down here than you are.

CHALLENGER Ah me.

CAPCOM I might add that not only do we have to stay up late, we have to get up mighty early to keep you honest too.

CHALLENGER Okay, you going to let us sleep 8 hours or what?

CAPCOM That's affirm, Jack, we're looking good on the time and we're not only - will you get - we hope 8 hours of good sleep but you'll have a full EVA tomorrow. So it's not costing us anything there.

CHALLENGER Sounds great, Joe. I fully expect it won't be much longer now.

CAPCOM And Gene, just for rough planning purposes, we'll start to figure your sleep period starting around 152:30. And we'll be looking at your getting up around 8 hours from that time.

CHALLENGER Okay, Joe, I'll buy that.

CAPCOM Might add also that there are a lot of us

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CAPCOM looking forward to that third EVA tomorrow. It's going to be the last one on the lunar surface for some time.

CHALLENGER I tell you if it's anywhere near what the first two were like, we're looking forward to it also.

CAPCOM Gene and Jack, we're still marveling at the beautiful television pictures that we're getting from your TV camera there. It's fun in fact, to watch the tracks that you're leaving behind in the lunar soil - both footprints and Rover tracks. And some of us are down here now reflecting on what sort of mark or track will someday disturb the tracks that you leave behind there tomorrow.

CHALLENGER That's an interesting thought, Joe, but I think we all know that somewhere, someday someone will be here to disturb those tracks.

CAPCOM No doubt about it, Gene.

CHALLENGER Don't be too pesimistic, Joe. I think it's going to happen.

CAPCOM Oh, there's no doubt about that. But it's fun to think about of what sort of - of devise that will ultimately disturb your tracks.

CHALLENGER Well, that devise may look something like your little boy.

CAPCOM Why, he'd make short work of them.

CHALLENGER Joe, I'll tell you it's also a pretty philosophical thought to think that you're riding around out here on what is really undisturbed - undisturbed everything, you know. If there was someone here, way back when sometime they didn't leave much - much sign of their whereabouts but, that's an interesting thought too. As you drive you cause your own Rover tracks and figure out those are the only ones that have - that maybe have ever been here.

CAPCOM Very true.

CHALLENGER And with that I'm rolling out my hammock. Okay, Joe, I'm waving goodnight to you, I'm rolling up my overhead window cover.

CAPCOM Okay, Gene and Jack, we'll say goodnight to you from down here, unless there's someother way we can help you.

CHALLENGER No sir. If there is we'll give you a call, though.

CAPCOM Just want to end by saying what a terrific job you did today and really looking forward to tomorrow. Have a good 8 hours rest.

CHALLENGER Thank you Joe. Tomorrow we answer all the unanswered questions. Right?

CAPCOM If not more.

PAO This is Apollo Control at 152 hours 26 minutes. The goodnights with the crew aboard Challenger were exchanged at 152 hours 25 minutes, and we plan to give them a full 8 hour sleep period which puts wakeup at 160 hours 25 minutes. That presumably

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PAO would move the start time for the EVA 3 back 1 hour. We'll be getting conformation on that shortly. And both the CSM and the lunar module continuing to perform almost perfectly as planned. Based on the telemetry that we're getting here on the ground and at this moment our large scribing plotter display in front of mission control, shows the command module America to be passing almost directly over Challenger on the lunar surface in the Valley of Taurus Mountains. America now on its 33 revolution of the Moon. And Ron Evans well into his scheduled 8 hour sleep period. Evans is right on the planned time for sleep. Sleeping right on the - on the flight plan times. During the sleep period we'll have the air-to-ground lines down. Normally that circuit gets rather noisy after the crew's gone to sleep - configured the lunar module to sleep. The power amplifier is turned off, the transmitter output power of the lunar module decreased from about 18 watts down to about 1 watt and that accounts for the noise that we frequently have on that circuit during sleep periods. For that reason, we will have the circuit down configured to record any conversations with the crew for subsequent playback. At 152 hours 29 minutes, this is Apollo Control Houston.

END OF TAPE

PAO This is Apollo Control at 153 hours 27 minutes. We have heard nothing from the crew aboard Challenger on the lunar surface, Gene Cernan and Jack Schmitt, for the past hour since we said goodnight to them. And we now have a little less than 7 hours until their scheduled wakeup time. We plan to wake them up at a GET time of 160 hours 25 minutes which would be 8 hours after we said goodnight to them. Ron Evans aboard the command module, America, is about to begin his 34th revolution of the Moon, and on this revolution we'll be sending Ron a wakeup call. Wakeup for him is 154:40, 154 hours 40 minutes. It'll be about 35 minutes before we regain radio contact with the CSM as it comes back around the eastern rim of the Moon on its 34th revolution. Both vehicles continuing in very good shape. One minor problem appeared to crop up with the lunar module following the repressurization after the 2nd EVA. The cabin pressure went up to about 5.8 pounds per square inch. This is about 8 tenths of a pound above what we think of as the normal LM cabin pressure. However, it is not unusual to see the cabin pressure spike up a bit on repressurization and then drop back down. However, this rise was getting fairly close to the pressure of which the cabin relief valves would open and relieve the pressure. One consideration when the pressure goes up in this manner is that perhaps one of the several sources of oxygen in the LM cabin might be leaking, such things as the portable life support system fill valves or the portable life support system itself, or one of the oxygen purge systems, or even the the main regulator valves that control the flow of oxygen from the LM supply tanks in the cabin. After isolating these possible sources one at a time, and still watching the pressure rise gradually, we elected to shut down both of the oxygen regulator valves and see what happened to the pressure, keeping a flow of oxygen through the cabin to remove carbon dioxide buildup, and on shutting down both regulators, the pressure did, in fact, begin to drop. The assumption at that time was that possibly one of the regulators was leaking slightly, allowing a small amount of oxygen above the needs of the crew and for replenishment, to flow into the cabin. And as the pressure dropped back down, we brought one regulator at a time on line. However, the pressure continued to fall back to its normal level of about 5 pounds per square inch even with both regulators on. So, at this point, the assumption is that nothing is the matter. There are a couple of possible explanations for the rise in cabin pressure. One is - one explanation is that one of the regulators was, in fact, leaking, and when they were recycled and reseated, the seal held properly and the regulators are now performing properly. The other possibility is that moisture from the suit circuits - the temperature rise caused by bringing things from outside the LM into the lunar cabin - rocks and other equipment that had been exposed to the Sun on the lunar surface - causing an increase in water vapor, carbon dioxide, and the slight rise in the cabin temperature, which would, in turn, bump the pressure up. Those are probably the most likely possibilities. In any event, the situation as it now stands is that

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the LM cabin's pressure is at 4.9 pounds per square inch which is within the normal range and there's no indication of any leakage either through the regulators or through the other sources of oxygen. It appears that everything is functioning normally. During this shift in Mission Control, flight director Gene Kranz has his flight control team reviewing the situation for liftoff. This team of flight controllers will be in charge of the lunar liftoff and they are considering such things as the ideal time to conduct the plane change maneuver with the command module, to put it in the proper orbit for subsequent rendezvous with the lunar module; also, looking at LM weights and performance characteristics, assuring that all that data is in proper form before the liftoff which we expect will occur at the flight plan time. EVA 3 will be, it looks like now, delayed 1 hour from the published flight plan time. This reflects the late sleep time for the crew, the fact that they began to translate to a one hour late start for EVA 3, and the EVA's plan for a full 7 hours duration. At 153 hours 33 minutes, this is Apollo Control Houston.

END OF TAPE

PAO This is Apollo Control at 154 hours, 35 minutes. We're about 5 minutes away from putting in a call to Ron Evans aboard America, now on its 34th revolution of the Moon. Ron, completing an 8 hour sleep period and flight surgeon reports that he has been sleeping soundly during virtually all of that sleep period. And Ron Evans right on the Flight Plan, the command module performing very well. During the sleep period, the pan camera, the mapping camera and the laser altimeter back in the scientific instrument module bay have been turned off. We have been gathering data from the infrared scanning radiometer and the ultraviolet spectrometer; and the telemetry data we received indicates that they're performing normally. For Ron Evans - rather for Gene Cernan and Jack Schmitt aboard the lunar module Challenger, they now have about 5 hours 53 minutes remaining in a scheduled 8 hour sleep period and the surgeon reports that Gene Cernan who is wearing the biomedical sensors during sleep period is sleeping soundly at this time, so the lunar module crew also appears to be getting well into their rest period. We show America in an orbit at the present time with a high point or apocynthion of 69 and 1/2 nautical miles and a low point or pericynthion of 53.4 . No signs of activity aboard the command module at this point. We'll stand by for the wake up call to Ron Evans.

CAPCOM Good morning America, how are you?

AMERICA Hey, Houston, this is the command module pilot of the United States spaceship America, and we're ready to participate in another days activity.

CAPCOM Glad to hear it Ron, good morning.

AMERICA Good morning.

AMERICA I slept with my light weight headset on last night so I didn't have to have that cap on, is the fidelity of this thing any good at all?

CAPCOM Pretty, good, Ron, pretty good. And, as you start your morning's activities, you can be aware that we were watching the spacecraft through the night and as flight puts it everything is swinging.

AMERICA Outstanding, that's what we like.

END OF TAPE

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AMERICA Hey, it's still dark outside.

CAPCOM We start work early around here.

AMERICA Well, I guess.

AMERICA Hey, Houston, America.

CAPCOM Go ahead.

AMERICA Joe, just to be kind of curious, how -
how the old heart rate compares compares to those sleep
tests that we did preflight - or say is it about the same -
when I'm soundly asleep or is it more, or what, you know?

CAPCOM Stand by Ron, and I'll ask the men
on the LM.

AMERICA Okay, maybe they'll have that information.

CAPCOM Rog. They think maybe 5 minutes.
We'll be back to you.

AMERICA Okay. No problem. Curiosity, more
than anything.

AMERICA I didn't get quite as much sleep last
night. I took a bath, changed my underwear, and all those
good deal things, huh. Oh, I probably got - oh, maybe
7 hours at the most. Probably closer to 6 1/2 good sleep.

CAPCOM Roger.

AMERICA And I'll give you the rest of that
in just a jiffy when I get her all squared away.

CAPCOM Okay.

END OF TAPE

CAPCOM Hello, America, this is Houston.
AMERICA Go ahead.
CAPCOM Roger, Ron. Apparently, in your preflight data base, they show you with a rate of - in the low 60's or high 50's. That's a sleeping rate, and we're showing you now, during your sleep periods of - heart rates of about 10 beats lower per minute, and with heart rates that show less variation than the preflight data shows.
AMERICA Ahah, okay, thank you much. The heart does slow down a little bit up here then.
CAPCOM Apparently so, they assured me, however, that it would not be approaching zero so you can relax there.
AMERICA (laughter) Okay.
CAPCOM And Ron, in the meantime, Gordo's arrived here, and I'll turn the console over to him. Be talking to you later, perhaps.
AMERICA Okay, Joe. Thank you much. Appreciate it.
CAPCOM Enjoyed it, have a good day. We'll all be watching you close.
AMERICA Okay.
AMERICA Okay, Houston, America. Here is my medical log.
CAPCOM Okay, Ron. Good morning.
AMERICA I just noticed I'm a day off. (laughter) Okay, Gordo, glad to have you aboard with us. Okay, PRD 15041 and the sleep I mentioned, probably 6-1/2 or 7 good hours. I took a seanal last night, and I had 4 cans of fluid.
CAPCOM Okay.
AMERICA Okay, here's the old chow for day 6.
CAPCOM Okay.
AMERICA Scrambled eggs, bacon squares, peaches, cinnamon toast with bread cubes, orange juice, cocoa with potassium, and a vitamin pill. Okay, a lobster bisque, all the peanut butter, all the jelly, 3 pieces of bread, citrus beverage, and tea, a chocolate bar, and a package of pecans. And I had a beef steak, butterscotch pudding, and an orange drink.
CAPCOM Okay, got that.
AMERICA I think that was it. Let's see, today I've got sausage, grits, fruit cocktail, orange beverage and coffee.
CAPCOM Roger.
AMERICA And I hope you have one of those preflight - not preflight, but what do you call it - geology summaries of EVA 2 like you had yesterday. I thought that was great.
CAPCOM Okay, Ron, I just picked it up. Let me read it over and then I'll give you a summary.
AMERICA Oh, okay, sure no problem.

END OF TAPE

CAPCOM Hello, Ron, I'll give you a little summary here of the EVA. It's going to be a little rambling, we haven't had time to organize it, but it was a very interesting night last night on the second EVA.

AMERICA Sure, no problem, go ahead.

CAPCOM Traverse lay over terrain of extraordinary geologic diversity and yielded a far greater variety of information than every obtained on any other lunar traverse. Systemic descriptions and samples of 4 of the 6 main units of the area, massifs, sub-floor, the light mantle and the dark mantle, were obtained. In addition, detailed descriptions were given of a variety of craters, including exciting discoveries at the crater Shorty, and descriptions of the Lee-Lincoln Scarp and lineaments in the hilly terrain. The South Massif is composed of two main varieties of breccia: Blue-grey and tan-grey blocks of both varieties were abundant at Station 2 up by Nansen. I won't go into the geologic details on those breccias, but they then found samples of the sub-floor unit exposed as blocks in the ejecta around larger craters that have been partly buried by the dark mantle. Stand by. Okay, they're gonna take the antenna away from us, Ron. I'll have to finish this next time around. Spacecraft's looking good, talk to you in about 45 minutes or so.

AMERICA Okay, mighty fine, Gordo, thank you.

PAO This is Apollo Control at 155 hours 11 minutes ground elapsed time. Even though there are some 4 minutes and 25 seconds remaining to actual disappearance of the spacecraft America behind the Moon, the network has taken down the uplink to the spacecraft so, for all practical purposes, we have had loss of signal to Ron Evans aboard spacecraft America. We'll see him again in about 48 minutes. Meanwhile the crew of lunar module Challenger is still asleep at Taurus-Littrow. To reiterate the new wake-up time for the Challenger crew it's ground elapsed time of 160 hours 25 minutes with the start of EVA 3 coming at 163:40, which is approximately 1 hour later than the Flight Plan. Current orbit measurements of spacecraft America: 69.6 by 53.5 nautical miles. As the spacecraft disappeared behind the Moon, the velocity in orbit was 5372 feet per second. The Gold Team of Flight Directors or Flight Controllers settling in for a fairly short day shift ending at 2:00 p.m., just after the surface crew has been wakened. Gerry Griffin in charge of the LM (lunar module) flight controllers and the CSM group headed up by Neil Hutchinson. At 155:13 ground elapsed time, this is Apollo Control.

END OF TAPE

PAO This is Apollo Control at 156 hours ground elapsed time in the mission of Apollo 17. Coming up on acquisition of signal in about 50 seconds the command module, America, coming around on her 35th lunar orbit. Command module pilot, Ron Evans, awake at this time, should be completing his breakfast and ready for a days work in lunar orbital science. Meanwhile the crew of Challenger on the lunar surface still asleep. About 4 1/2 hours until they're awakened for the third and final EVA of this mission and of the Apollo program. Waiting for confirmation in about 5 seconds or perhaps a few more seconds that network has indeed locked onto the signal from spacecraft, America. We do have acquisition. Let's join the air-ground 2 circuit for any conversation during this 35th front-side pass.

AMERICA Houston, this is America. I see you tried to come in there.

CAPCOM Yeah, Ron, you're loud and clear.

AMERICA Okay, I'm just finishing up my fruit cocktail.

CAPCOM Okay, while you're munching there, let me give you a few status reports here. First of all your RCS is clicking right along there 4 percent above the flight plan line, however we have some plans for that 4 percent, which I'll go over with you later. On the oxygen - you've gained a little on it - since I was last on, anyway. O2 tank 1 is a little low but it's balanced by tank 3 being a little high and tank 2 is right on the red line so I think they all balance out to be about on the red line - on the flight plan line and they all three balance out to be right on the flight plan line, as close as I can tell. Hydrogen - You're probably up about 4 percent in tank 1 and the other 2 are right on the line so you're in good shape there, still.

AMERICA Very good.

CAPCOM Okay, while you're - I've got some words on - on your orbit here which won't require anything - writing down anything. But for some reason you're missing the vascons or something and you're orbit is not degrading like we expected it to. It's not degrading down into circular orbit. It's - I think it's staying just about the way it was. And so we're looking ahead to plane change and we're thinking about an extra maneuver prior to plane change - about one hour prior to plane change on the back side. There was some discussion here about what to call that maneuver. Somebody wanted to call it a HAM, a height ajust maneuver, but someone else said, "Well, that one's already used in the rendezvous sequence. Maybe we ought to make it BACON." And even LOX was suggested

CAPCOM considering the FIDO's of - objected to BACON because of his religion. So LOX was eliminated because we've already used that for the S-IVP.

AMERICA How about Vascon Adjust.

CAPCOM Anyway, what the maneuver is going to be - whatever we call it, , is about about a 11 foot per second RCS burn one hour prior to plane change. So that will be on the back side. And that will just about use up your RCS overage and put you back on the flight plan line. That will adjust the height when you get around to the plane change and then the plane change will be a little bigger than originally planned. It's showing about 365 feet per second SPS of course. And looking at the consumables, that will put you down right on the rescue red line on SPS, so we're still in good shape that - consumable wise.

END OF TAPE

CAPCOM Further tracking will resign this, of course, so we'll have updates on the plan. Any questions on that. Over.

AMERICA No, it sounds like ya'll thought it up and I appreciate letting me know about that. Is the timeline worked out good enough in there - working a P41. I guess it does an hour before.

CAPCOM Yeah, well, we'll make it. I haven't looked at it myself but we - SAO has and I have a good idea of what needs to be changed if anything. Okay. On the SIM bay basically there's nothing new to report and all the people down here appreciate your timely operation of the SIM bay and it's responsible for really maximizing the data return. In general we're pretty happy. The problems that we're having with it are ones that have already been mentioned to you. On the HF antenna retract problem - that we have - if we haven't - here is the plan. Well, first of all, the consensus on that is that we really think the antennas are retracting okay - that it's a malfunction in the limit switch that drives the talk back - that's really the problem. But we have devised an alternate method - utilizing timing and stall current and actually the signature of the motor stall current down here in the data to determine proper retraction and at just prior to 168 hours in the flight plan, you're supposed to retract those antennas and we're going to check the data at that time and say yes or no they are retracting or they aren't. If they don't, then the ultimate plan we'll swing into at that time is to reschedule the HF targets that are now scheduled on REV 55. Reschedule them and do them on REV 42. After which, we'll try one more time to retract the antennas and if it still looks like they indeed are not retracting I guess it's just the one that's in question. That we'll go ahead and jettison on the - at that time and we'll still have gotten most of the - at least priority HF targets with that alternate plan. Over.

MAERICA Hey, that sounds like a good plan to me.

CAPCOM Okay, we've got one request from EECOM here. Can you turn the H2 tank 2 fans off, please.

AMERICA H2 tank 2 fans are off now.

CAPCOM Okay. And when you get between courses of breakfast there, I have some pencil work for you in the way of the flight plan updates - not too much really.

MAERICA Okay, contrary to the way I eat breakfast on the ground. I always end up leaving my orange juice 'till last. I guess that's the case - I'm going to have to eat the hot meal first.

CAPCOM Rsg.

AMERICA Well I'll tell you the only thing I've got left to eat is orange juice and I'm ready to copy.

CAPCOM Okay, 156 22 which is coming up here. I'd like to at that time verify all command module VHF's OFF. You're now 11 after - you have to terminate the jett on monitor and get the sounder operating I can break this off at anytime if you think we're pressing that. Just interrupt me. At 156 50 lunar sounder pad G start is 156:51:05, and G stop is 156 56 09. Over.

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AMERICA Okay, G start 156 51 05, 156 56 09.
CAPCOM That's good. Flip the page - flip two pages and
copy the next sounder pad which is for 158 40. G start is 158 49 35,
and stop time is 158 -
AMERICA Wait a minute - wait a minute I'm not with you.
CAPCOM Okay.
AMERICA Okay, I've got it.
CAPCOM Okay, G start
AMERICA Go ahead now butterfly.
CAPCOM 158 49 35 and stop is 158 54 38.
AMERICA Okay, start 158 49 35, 158 54 38.
CAPCOM Okay, that's correct. Now on that same page,
158 13, after pan camera on, add a line that says V over H override,
high altitude.
AMERICA Okay, 158 13, V over H override to high altitude.
CAPCOM Okay, and at 158 -
AMERICA I think it's still in high altitude from yesterday,
yeah it is.
CAPCOM Okay. 158 21 is another verify all command
command VHF off.
AMERICA Okay, at 158 21 verify all VHF off and I know what
that means.
CAPCOM Okay, the next two are easy. Next page, at 159 01,
just draw a line through mapping camera retract and at 159 05 -
AMERICA Okay, I've got it.
CAPCOM Draw a line through mapping camera laser altimeter
cover closed.
AMERICA Okay, got it.
CAPCOM Okay, I think we're caught up. We're ready for
high gain auto.
AMERICA Okay, I'll be back and see where we are on the
old flight plan.
AMERICA Okay, you have auto.
CAPCOM Okay.
AMERICA Okay, I don't think this light weight headset is
quite as good as the other one and I'm going to change as soon as I
get a chance here.
CAPCOM Okay.
AMERICA Okay, VHF A is OFF, B is OFF and C GARBLE.
P data is OFF, beacon is OFF, ranging is OFF. That's all. (Laughter).
CAPCOM Okay.
AMERICA I was looking at Akin when it came around that
side. Akin is almost right in the terminators right now. So when
you come up on terminator photos there - the only thing is that even
though it was down in the shadows down at the bottom of the crater,
I could still see the bottom of the craters - when they come around
there for the near - terminators photography. I'm going to open the
camera up and take a picture down in the shadow itself and see if

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that works.

CAPCOM

Okey doke.

AMERICA

Cause there was quite a bit of backlight - quite a bit of backlight reflection from the northeastern side of it and also the eastern side of it I guess. It's pointing down in the eastern rim -

CAPCOM

Say Ron, if you'll give us ACCEPT we'll give you a vector while you got it.

AMERICA

The only way I can describe it - okay, you have ACCEPT.

CAPCOM

Roger.

AMERICA

And additional clear.

AMERICA

With the shadow effect on the eastern - I guess the east and southeastern into your rim of the crater it reminds me a lot of some eroded -

END OF TAPE

AMERICA eroded hills. Like if you've got a valley that maybe has a 20 foot - it's bigger than that - but, say I've got a 20-foot drop on the thing where it's been just rain erosion down the side and it kind of washes little - little valleys down it here and there and leaves mounds and humps inbetween that haven't eroded away yet. And that's the side of that crater looks. Now, the other side of it, the northeastern rim of it and the interior rim looks just like one a - one of the massif units. That is, it's a very fine texture, no real erosion processes, just a smooth gentle slope.

CAPCOM Roger.

CAPCOM Okay, Ron. It's your computer go back to Block.

AMERICA Okay, we're at Block.

AMERICA You know that Skylab drink pack has really been a pretty good deal. Because you can use the nipple that's on the end of that thing, and use it for all of the beverage packages. And that way you don't have to cut open the end of it and let it drip out all over the place.

CAPCOM Hey, on that (garble) Skylab (garble).

AMERICA (garble) nipple in it.

AMERICA I'm not sure if they have any of our beverage packs or not. I think they're all packaged in these expandable little things we're using for water cans.

CAPCOM I see.

AMERICA Say, Gordo, what day is this?

CAPCOM Had to think there myself. It's Wednesday. It's about 9:15 in the morning, Wednesday.

AMERICA Ah, ha. Thank you. I guess I could have figured it up but -

CAPCOM That's why we're here, to answer important questions.

AMERICA (Laughter) that's right. Hey, getting ready for (garble) to standby. That's verifying.

CAPCOM Roger.

AMERICA The recorder is - Radar is on, recorder is off, not heaters. Let's see, the old mode is still VHF. Ah, ha, get to control the spacecraft again. (garble). It takes about 5 minimum impulse blips to get a 10th of a degree per second.

CAPCOM Roger.

END OF TAPE

AMERICA Well, the dark canyon around - around Serenitatis as you look north the dark variation there and kind of looking back - looking a little bit backwards now isn't that dark, as though continuity which is (garble) all, goes right down the middle of the ridges. As you look directly east of Littrow - east - I mean directly west of Littrow, the (garble) is there, and then there's comes out at you and you have the light tan - tannish - tannish dark I guess you'd call it dark tanish grey and then you get out to the light tan of the mare Serenitatis itself.

CAPCOM Okay Ron.

AMERICA I was looking almost directly into the Sun and you can still see a topographic expression - topographic high around the rilles in the Tacquet area and also the greyness has disappeared out of that - out of that dark material and it just in looking into the Sun it looks more of tan, a darker tan than the Serenitatis area and you can also see the topographic rise to it. Now I'm looking quite a ways away from it and looking down on it.

CAPCOM Rog.

AMERICA You know that kind of funny. Now looking back Sulpicius Gallus and just to the north of that there's a crater that's about well it's right at the end of those rilles that go north from Sulpicius Gallus and you can really see the ejecta blanket. The ejecta blanket looks very dark around it. Now in this Sun you look out across the Mare Serenitatis now and you get toward sunset looking back into the Sun and the color is disappearing all except from that one spot. Now that must be either a fresh ejecta as you lose the brightness of it or something either that or its dark, it's sure a dark a dark ejecta blanket around it. The blanket itself goes out maybe 2 - 3 crater diameters and it looks like it has kind of a ray-type pattern to it. Oh, about that crater, I don't even know if it's got a name or not, but I'll mark it on my map.

CAPCOM Okay.

AMERICA Now that I've got the day, it must be time to do something.

CAPCOM Yeah, it's time to turn the recorder on.

AMERICA Recorder on - recorder's on.

CAPCOM Okay.

END OF TAPE

AMERICA - just ah -. I don't know where I am right now, to be honest with you. I looked out window 3 - I'm right on the terminator and let's see I'm going west. So, we've got to you at - ah - there's kind of a little bit of a mare area down there. Okay, I think it is. And, you can see lava tongues sticking out through there and lava flow fronts with the high side on the east side, because you've got a shadow all the way along the front. And they're about ah - In that one area you might consider a scalloped area, an ejecta scallop, but coming out of that one area, you can see a crazy lava flow coming out from it.

CAPCOM Roger on that.

AMERICA The reason the flow -

AMERICA These are Apennines I'm just going over, aren't they?

CAPCOM That's right. That's what they ought to be. We need the IR -

AMERICA You look back across the - Okay.

CAPCOM I need the IR cover closed, please.

AMERICA Say, again, Gordo.

CAPCOM We want the IR cover closed, right away.

AMERICA Okay, it's going closed. Okay, it's closed. How about the EV? IR cover is closed.

AMERICA I was just going to say, looking back across Mare Serenitatis into the sun, now, there must be Bessel. There's an ejecta pattern out there - When you look at the ejecta patterns into the sun, they all look black with respect to the Mare. I think it must be a shadow affect or something that you get off of the raised ejecta that comes up across it.

CAPCOM Roger.

CAPCOM Hey, Ron, that frantic call there was because the sun is starting to get into the IR and we didn't, hadn't really thought that would happen, but, started to see it get in there, but you caught it in time. The cover saved it.

AMERICA Okay. Real good. I figured that's probably what it was.

CAPCOM Now, you can go ahead with the rest of the steps in there with the UV off after sunset.

AMERICA Okay. Mapping camera going OFF, covers closed to the IR so then we'll cut it off. Pan camera's off test, OFF. And let's see, I don't see the see the sun shining on the light out there, must be sunset. Yep. It sure enough is, though. Okay UV's going off. You want the IR covers back open just to keep things straight here?

CAPCOM Stand by on that.

AMERICA (garble) - Next time we use the IR let's just remember to open the cover.

CAPCOM Okay, just open it up the next time we use it, which is in about 15 minutes. We'll remind you on that if you forget.

AMERICA Oh, okay. - That's right - Okay. That's right these are just short science passes now, aren't they?

CAPCOM That's right.

CAPCOM Ron, I can finish up my description of the last night's EVA if you like, since there's nothing to look at now. I'm watching the clock on the Sounder start for you.

AMERICA Okay. Yeah, appreciate it.

CAPCOM Okay, I think I left off or was cut off there without mentioning 2 varieties of breccia in the South Massif. They found blue-grey and tan-grey, and without going into the geological details, those are the two types they found up there at Nansen. The subfloor unit was exposed as blocks and ejecta around larger craters has been partly buried by dark mantle. And craters have apparently penetrated within parts of the light mantle. Especially good samples were obtained from the rim of Camelot where the same textural characteristics which are banding caused by variations in vesicle concentration. Coarse grain-size and mineralogic features as reported in EVA 1 were found so, -

END FO TAPE

CAPCOM As reported in EVA 1 were found so apparently this uni - unit is quite uniform over the distances that they've covered so far in the traverses. The prominent East facing scarp crossing the valley floor from north to south, about 5 kilometers west of the LM was traversed twice near the crater Lara near Hole-in-the-Wall, although Hole-in-the-Wall appeared to be pretty subtle. No change in the surface characteristics or lithology of the mantle was discernable where the astronauts traversed the scarp. Outcrops of boulders were observed farther to the north. Where the northward extension of the scarp crosses the face of the North Massif it forms a notably smooth and relatively young appearing surface. Elsewhere the surface of the North Massif is violently furrowed in textured. And the crew described it as a cross hatch pattern on the surface that they could see. One set of lineaments dipping eastward and the other westward at about 30 degrees. Some of the most interesting observations made during the EVA were - were related to craters. Many small craters within the dark mantle have glass coated central pits. Jack called them dimples. Some of the pits are nearly cylindrical and maybe half again as deep as the crater itself. Other small craters occurring on both the dark and light mantle have bright halos but these halos appear to be noticeably brighter on the light colored material. This bright material is not blocky or fragmental ejecta derived from a sub floor layer but rather, appears to consist of instant rock or soil breccia, which is then partly consolidated by the impact shock itself. The most interesting eureka during the EVA was at station 4, Shorty crater, where Jack found some bright red or orange, he described it, orange dirt within the gray to dark gray rim materials. The colored banding is circumferential to the crater and resemble alteration halos which occur around many terrestrial volcanic vents. So you can see why the geologists are excited on that one. The morphology of Shorty, however, is similar in some respects -

AMERICA Yes sir you betch ya.

CAPCOM Impact craters, hence the size interpretation of it's origin may depend on sample analysis. And I've got about a minute and a half to start the sounder. You might be close to 2:30 there. If you aren't - They took a total of about 850 pictures. They've taken a total of 1270, would you believe, pictures so far on the lunar surface, including about 5 - 150 with the 500 millimeter camera. Mostly of the North, South, East Massifs and Family Mountain. They got

CAPCOM 56 samples, 2 double cores, probably about 36 kilograms worth, and they traveled a total distance of 20 kilometers. Over.

AMERICA Hey, sounds like a good summary. They're finding all kinds of things up there. Which is the reason you're an explorer, I guess, to find - to see what you can find.

CAPCOM Yeah, they - they were really in their element last night. About 30 seconds to G start time. I'll let you call it yourself, though.

AMERICA Okay, I'll get it. Data systems are off. (garble) 05.

CAPCOM Okay.

AMERICA Hope this takes in that linear gabbro. Then you can find some sort of a photographic expression. To that light colored material around there. It looks to me like there is - right around the Reiner gamma itself.

CAPCOM Roger.

AMERICA Maybe the lunar sounder will collaborate by Moonlight investigations here or Earthlight investigations - I'm sorry. (laughter). While we're waiting here - I decided to sleep last night without being tied down or anything. So I selpt in the - what do you call them in the Navy? -

CAPCOM Hammocks, I think.

AMERICA Well. Anyhow, sleeping strings, we call them up here. Yeah, sleeping bags - some kind of sack. And the last 2 or 3 nights what I'd do is put the lap belt on loosely. And you know, it just kind of keeps you from rolling all over the cockpit. Then last night I didn't put it on at all and stayed in the sack. And I really didn't go too far anyhow. One time I woke up and I was crossways in the couch up here and then when I woke up this morning my feet were up in the tunnel. And my head was kind of still in the center couch, more or less. So you really don't roam around too much that way anyhow. Even if you aren't tied down. And you can get the "hug your pillow" effect by being inside that sack and laying your head on the outside of the sack. It just about fits me, except that if I stretch my feet out - then I get a little bit of a pull. Little bit of a pull - on it and it feels like you hug your pillow that way.

CAPCOM Kind of a security blanket effect, huh?

AMERICA (laughter) Yeah, right. That was the biggest problem the first 2 or 3 days here - What do you do with your head when you go to sleep. I'm used to sleeping

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AMERICA with a pillow. And I'm used to sleeping on my side. And it's amazing the psychological effect that you can get from - for me it hard to go to sleep just laying on my back. So you can turn on your side and go right to sleep. (laughter). What's your side - what's your back - I don't know but anyhow it works.

CAPCOM That's got to be psychological.

AMERICA (laughter). It sure is.

AMERICA 5 6 7 8 mark it. Lunar sounder is
standby.

CAPCOM Okay.

END OF TAPE

AMERICA Okay, recorder is going OFF.
CAPCOM Roger.
AMERICA Data systems coming ON.
AMERICA Okay, select power is ON.
AMERICA Again, we need to open the old door.
IR OFF, barberpole, gray bar. I get the (garble) in here.
CAPCOM Forget some of that, Ron. Sounds like
the mike might have slipped away from your mouth.
AMERICA Okay, that's a good point - let me change
my headsets here. Maybe I run right through the flight plan
with all that stuff.
CAPCOM Okay, and -
AMERICA Also got the IR cover open.
CAPCOM Okay, great memory there.
CAPCOM Ron, if you like, while you're getting
ready for the 52, I can summarize the news real rapidly.
There wasn't a whole lot.
AMERICA Okay, sure go ahead, I've got different
headsets now, is that okay?
CAPCOM Yes, you're loud and clear. Former
President Truman is still hanging in there. His heartbeat
and breathing became unstable yesterday, but then improved
again. Of course, the big headlines were about the discovery
of the orange dirt at Shorty Crater. And there was a picture
of Jan, John and Jamie in the paper watching the EVA on TV.
The only thing new on the peace talks is that Kissinger will
probably be coming back to the United States today and there's
a rumor - the French Press said that the compromise is in the
work on the withdrawal of the North Vietnamese troops from
the south. The Rockets lost - the Aeros, the Hockey Team,
won last night. They beat the Alberta Oilers. The Rockets
lost to Buffalo. And the weather finally cleared out. The
cold front cleared out the wet stuff and last night I think
was the first time since you guys launched that we've had a
look at the Moon so we had a direct look at you last night.
It was just nice and sunny here this morning when I came to work.
Over.
AMERICA Thanks for the news and I guess those
3 guys that went up to the Moon - you know, they probably
cleared that weather up there in Houston.
CAPCOM It sure took you awhile though.
AMERICA (laughter) Right.
AMERICA Okay, 14 - this compass again, the same
ones I had last night I think. That's Canopus. Canopus looks
about as bright as Sirius, but not quite.
CAPCOM Roger.
AMERICA My sextant is good in everything like
that but you just can't quite get the radical in focus.

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CAPCOM
AMERICA
going to be.
CAPCOM
torque them.
AMERICA
make it 0630.
CAPCOM

Roger.
It's kind of the way they said it was
Okay, Ron. We copy those. Clear to
Okay, let's see, we'll torque at - oh
Alrighty.

END OF TAPE

APOLLO 17 MISSION COMMENTARY, 12/13/72 10:00CST 157:06GET 621/1

CAPCOM Ron, we've still got about 5 or 6 minutes until LOS but in case we drop off on your maneuver in there - just want to tell you that everything's looking good. I think the IR is pumping out good data so with that fantastic team work we saved it back there and we'll see you next time around.

AMERICA Well, okay. Sounds good there's old Al-debaran in there. The center must still be out of the - there it goes - this is - Okay, wind the old GDCers.

PAO This is Apollo Control. We've had loss of control from the spacecraft America, going behind the Moon, nearing the end of the 35th lunar orbit. That orbit measuring at this time 69.5 nautical miles by 53.6. There is a plan under consideration now for a small trim maneuver just prior to plane change maneuver. Some 12 feet per second with the RCS thrusters too tune up the orbit a little bit. This currently appears to be around 181 hours 33 minutes, with the plane change approximately an hour later. Command Module Pilot, Ron Evans continuing to operate the scientific instrument module experiments in the service module of his spacecraft. All systems apparently operating nominally. Three hours 13 minutes remaining until crew of Challenger is awakened at Taurus-Littrow landing site. And at 157:16 ground elapsed time, this is Apollo Control.

END OF TAPE

PAO This is Apollo Control. We've acquired the command module, America coming around on the 36th rev. He's on a bad omni antenna at the moment, just barely readable, but we'll stand by here until the communications improve and Gordo Fullerton can continue the two-way communication.

CAPCOM Hello there, America, we hear your scratchy sounding omni.

AMERICA (laughter) Probably so.

CAPCOM You're readable but noisy.

AMERICA You're cutting in and out on the omni - I thought i couldn't get you.

CAPCOM Roger.

AMERICA Looks like we'll get the high gain here pretty quick (garble).

CAPCOM Roger.

AMERICA Okay Houston, America, we probably have pretty good comm now huh?

CAPCOM Yeah, Ron, we're getting you now and sound good.

AMERICA Okay, I don't have any observations to report from the backside. About time for blue bag number 4, somebody has got to develop a better mouse trap.

CAPCOM Roger on that.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/13/72 11:03 CST 158:10 GET MC-623/1

AMERICA Okay, pan camera's in stand by.

CAPCOM Roger, Ron.

AMERICA (garble) Power's coming - power's coming
on and V over H is in the high altitude.

CAPCOM Okay.

CAPCOM Okay Ron, we're ready for self-test.

AMERICA Okay, going to self-test now. Barber pole.

CAPCOM Roger.

AMERICA Okay, by the way, Mag Lima Lima is empty,
165 frames showing there. Started Mag Mike Mike with frame
number 95 finished the orbital science at 142. Took the
crazy camera at 5.6/125th when I got ready to change to 5.6/250th
I looked at the crazy thing and it was setting at F-11. Maybe
those first frames in there, maybe they can develop them a
little different or something and still bring - get them to
come out.

CAPCOM Okay Ron, we got that.

AMERICA I think what happens is I must have been
holding the thing by the lens or something or I bumped the -
the F stop -

END OF TAPE

AMERICA The f-stop thing somehow.
CAPCOM Ron, we're ready for pan camera to OFF and did you go to heaters after you set the sump test switch to sump test when we started this.
AMERICA No, I just went back to OFF, was I supposed to go to heaters?
CAPCOM Okay, we'd like it in heaters now.
AMERICA Okay, it's going to heaters and now it's spring-loaded to off and I just left it there. Okay going to heaters and now it's going to power is OFF.
CAPCOM Okay.
AMERICA Okay, let's see are we ready for lunar sounder? It is blocked down here by panel 230 (laugh), not really I can look back and see the GARBLE. Okay, it's about time. Okay, lunar sounders verified and stand by. The recorder is going ON. Radar is going ON. And recorder OFF, not the heaters. If antenna 1 verify extend - no barberpole docked off - number 2 extend - no barberpole back to OFF. Okay, mode is going to HF and let me take a look at Alfa is OFF, Bravo is OFF. B data is off, Beacon is OFF, ranging is OFF. Okay, let's see. 250 lens. Okay - 5.6 - Infinity GARBLE. A - I can go the temporary storage bag, QQ goes off PLSS - 4 frames - that's going to be window 3. Okay, had his nose up against window 3 here - got to wipe it off. Boy these windows have really been great though. They haven't - don't have any coatings or anything like that on them.
CAPCOM Roger, on that.
AMERICA (GARBLE) there's little micro meteorite hit window 3 right in the middle of it - it looks like two of them out there - it's about - much smaller than a 32nd - 64th - a 64th in diameter probably. It's a little round. Doesn't seem to have any - it's just a pit, you know.
CAPCOM Ron, you said that was window 3.
AMERICA Window 3, yeah.
CAPCOM Okay.
AMERICA Ah, it scared me for a minute there. I was configuring for terminator photos and I looked on the near side terminator and I didn't see any unfortunately.
CAPCOM Yeah, Stu and I were looking at the same thing. We're just about a 30 second minute I guess.
AMERICA Okay. One's of Aitkin on the far side, okay. Hitkin (?) and Iban - Hi-Ann or something like that, Debber Ibn Diann, yeah- You know you can come across the attack A area again and

END OF TAPE

AMERICA There doesn't seem to be any - did you get this, a bright crater - a recent crater in the annulus - in that dark annulus the southern part of Serenitatis. It shows up again as that kind of a blue-grey brightness, as opposed to the tannish - tannish brightness of the - of the bright craters in Serenitatis. There's still is no Fair and Wrinkled Ridge - there's no color tone or differentiation in the Wrinkled Ridge area in this part of it. The only differentiation and it looks like south of Tacquet you get the same color tone variation occurs on over into Tranquillitatis. When you get to the Tacquet area, from Tacquet up to Milorisen. I wish I could remember the name of that crazy crater.

CAPCOM How about Manilius.

AMERICA Manilius, that's it. Yeah. From Tacquet on up to Manilius now, the - that's got to be a buildup of material and it's more on the tan side than it is on the - more of a dark tan than it is to the tannish grey. So it's a different type of material than - than on the annulus down below the crater Tacquet.

CAPCOM Okay, Ron, you're saying this is sort of a angular plateau, then, that stretches across between Tacquet and Manilius?

AMERICA Yes, it is. It's an angular plateau in there and the plateau is got to have been coming from those rilles that are down in there.

CAPCOM Okay, do those - maybe you've already said this - do those wrinkle ridges cross the color boundaries?

AMERICA No, I can't find the Wrinkled Ridge that crosses the color boundary. The Wrinkled Ridges are at Serenitatis itself, and there is no color boundary on the western edge of Serenitatis. It's all the same.

CAPCOM Okay. Those sound like super good observation, Ron.

AMERICA And this side - I'm just passing over Sulpicius Gallus now. And just beyond Sulpicius Gallus - Sulpicius Gallus is out in the Mare Tranquillitatis itself, and it looks like you - it's either a talus slope, you know, you got a gentle slope of the - of the massif coming down and then it changes slope a little bit, and it looks like you have finer grained material. And that might be what we at one time or another called the high water mark, but I kind of believe that's just a talus change in the slope. As you go on down there in the bottom. But as soon as you cross that area - we're going west now from Sulpicius Gallus - again we've got the kind of the same tannish - a dark tan material that essentially covers the highland near this highland-type of an area here. It's a hummocky type material. There are a few rilles just north of Sulpicius Gallus; those rilles, again, have - have the dark tan material on it. About the same as the - same color tones that

AMERICA you pick up from Tacquet to Manilius.

CAPCOM Okay, sounds great. Keep talking, we'll cue you as the flight plan events come up.

AMERICA Okay. De Caldera is sure fascinating. I'll try and take a quick look with the binocular on that one. Gosh I can't find it - there it is. I hope the pictures will kind of confirm a little bit of a topographic rise around the DeCaldera, just a slight one and it's about half the width as you look at the "D", it's a half a width of the "D", not the height, but the width. And it seems to be raised, kind of a raised, flat rim around it. The color of the raised bumps down in the De-Caldera are the same as the surrounding material, around there. The bumps that are raised up are smooth looking and the depression for it has to be a Caldera I guess, or at least a part of the depression anyhow is a light bluish grey; I'll call it that way, very light bluish grey.

CAPCOM Hey, Ron I'm not suggesting you do, because it's probably trouble to find, have you tried the color wheel, comparing it on any of this stuff?

AMERICA (Laughter) No, I haven't. Let me try, that's a good idea though. I'll try that and see what I can come up with on that thing.

CAPCOM Well, don't go to a lot of trouble, I never got around to it, but you might peg down some of these colors a little better. It ticked me, when you were talking last night on the back side -

AMERICA That's a good point.

CAPCOM - on one of those passes about the green.

AMERICA Yeah.

CAPCOM Okay, you're about 7 seconds away from where we're wanting the recorder on, Ron. Any time near here is fine.

AMERICA Okay, recorder - let's see, is on. Verified radar is on, remove HF, okay. You know to me, the Moon's got a lot more color than I've been led to believe. I kind of had the impression that everything was the same color. That's far from being true.

CAPCOM Okay.

CAPCOM I guess maybe we could say, perhaps color is in the eye of the beholder.

END OF TAPE

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CAPCOM Say, perhaps color is in the eye of the beholder.

AMERICA I think there is a considerable amount of truth to that. Whistling.

CAPCOM Okay, Ron we'll take the mapping camera off, now.

AMERICA Okay, the old mapper is going off.

CAPCOM Ron, you're clear to go to standby on the mapping camera.

AMERICA Okay, mapper's going to standby. Motion up, barberpole. Camera is OFF, pan camera soft test OFF. Okay, got the old slack power OFF again. Consumer slack away feet power is OFF. (Humming) (Whistling) Okay, there must be sunset. IR is coming - OFF. A OFF. Okay, I'm going to go to plus X. Buttons 52 .25. There is an uplink, VERB 58 and Earth. 141 - that's very close. 10-8. Ah - let's see 6641. They're at 48 07, Earth 4935 - that's about right.

END OF TAPE

CAPCOM We're out about a minute and a half to
T-start now.
AMERICA Okay, cue-B center.
AMERICA OFF T Bravo
AMERICA Off, okay, data systems -
CAPCOM Okay, 30 seconds to T-start.
AMERICA Right, okay at 40 - okay, I got the high
gain OFF. Got my finger on the data systems, okay, data
systems are going OFF, operate at 4935. Operate. 438. Give
me a call Gordo. I'm going to look out the window here for
a bit.

CAPCOM Sure will, Ron.
AMERICA A minute before that or so.
AMERICA The lights up, it might not be light adapt.
AMERICA I was trying to think if there was any-
thing I could add to the Reiner-Gamma observation there, I was
right over that - the light albedo of that type of material
that goes perpendicular between Reiner and Reiner-Gamma. It's
kind of a crooked type - you know it goes for a little ways
and then it breaks off into a dark albedo type stuff and then
breaks off in another direction a little bit. So it doesn't
look like a straight ray at all.

CAPCOM Roger.
AMERICA You know, you can see crater holes and this
type of thing. You look right down on Reiner now, and you've
sure got that dark annulus - the lighter albedo type stuff
is essentially in the middle of it and the annulus is - let's
see maybe 30 kilometers wide by twice as long - it's a rela-
tive size, anyhow - by twice as long, and that's the dark area.
And then around that - the light albedo stuff is about half
of the width, and it's lighter on the outside than it is on
the inside. The inside is not quite as light as the - I'd
call it the rim, I guess. It's very hard to see any -

CAPCOM Okay.
AMERICA Great, great, great topographic expression -
the reason I say that is because it kind of blends in with every-
thing whereas if you look at a crater out here in the middle of
the Mare or a hill - you get a brighter - part of it's bright-
er than the surrounding territory, you can actually see the
demarcation. So that's the way you get your depth perception
out of it.

CAPCOM Okay, about 30 seconds now until T-stop.
AMERICA Okay, T-stop is 5438 and we're going to
stand by at that time. Base switch - 34567 stand by.
CAPCOM Okay, I'll give you a call in a minute.
AMERICA Okay.
CAPCOM Okay, Ron. It's been a minute.
AMERICA Okay, recorder and OFF - not heaters.
Radar is OFF, data system goes back on, high gain antenna
power ON and we're about minus 44, I guess, and select the

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AMERICA old high gain, there we go, REQCQ AUTO.
Narrow. ENCO's going to do some commanding, goes (garble)
function is gone continue on here to the select power. Okay,
select power is ON. Mapping camera is standby.

END OF TAPE

AMERICA do a self test is on the purge line heater. Doing better than(garble) survey, I guess. And - leave that cover open there and let the (garble) get some data for a while, Dr. Low, or whoever happens to be there. And I'll step ahead and sample the old bus.

CAPCOM Okay.

AMERICA Do, do, do, doodle do do.

AMERICA Houston, America. You might tell the medics not to pay any attention to those sample numbers on those buses, pay attention to GET time, because when you take them out of the buses storage bag, the right one never comes out, so it makes any difference just pay attention to the GET time.

CAPCOM Okay, Ron. I'll pass that along.

AMERICA Dun, dun, du dun, dun, dun, dun, dun, dun, .

AMERICA Okay, guys, on Challenger, are they going to go out the regular time or are they getting a little extra sleep-period here or something.

CAPCOM I think we're letting them sleep in again, today. They're getting up 1 hour later than the flight plan shows, however, there's enough pad downstream that we're planning on ASCENT at the scheduled time.

AMERICA Okay.

AMERICA (Humming and whistling.)

AMERICA (Humming)

AMERICA I think I'll ah - the stowage vent on just for a little bit.

AMERICA (Whistling)

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/13/72 CST 12:00 GET 159:07 629/1

CAPCOM America, Houston. We've got a couple items of general information as you come up on AOS here - LOS. We want to remind you to close the -

AMERICA Okay.

CAPCOM IR and UV covers before you do any dumps. After LOS -

AMERICA Okay, will do -

CAPCOM You'll have to reconfigure the comm. And I suggest you wait on the dumps, as per the flight plan till after the photos. We estimate the waste water dump will take 10 minutes. Over.

AMERICA About 10 minutes on the waste water. Okay.

AMERICA Okay, must be over low bit rate, okay low bit rate with data systems no DSE voice, I'll write everything down.

AMERICA Okay, we'll clip all the hoses and stuff hooked up down here.

CAPCOM Just about LOS, Ron, see you later.

AMERICA Okay, Gordo, thank you much.

PAO This is Apollo Control at 159 hours 13 minutes ground elapsed time. We've had loss of signal, as Ron Evans, flying the spacecraft America, passed behind the Moon nearing the end of revolution number 36. An hour and 16 minutes until Cernan and Schmitt, aboard Challenger are awakened for the third - for preparations for the third Moon Walk. America, now in an orbit measuring 69.1 by 53.7 nautical miles. We'll come back up at the next front-side pass by the spacecraft America in about 48 minutes, and switch over to the wakeup call to the Challenger partway through that 37th revolution. At 159:14 ground elapsed time this is Apollo Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/13/72 12:50 CST 159:57 GET MC-630/1

PAO This is Apollo Control at 159 hours 57 minutes ground elapsed time in the mission of Apollo 17. Less than 1 minute away now as the command module America, Ron Evans doing his orbital science tasks and orbital photography. As he comes around on revolution number 37; less than a half hour until the wake up call is made to the crew of Challenger on the lunar surface. At that time, we'll switch over to the air/ground 1 circuit and eavesdrop on the conversation between Cernan/Schmitt Cernan and Schmitt and the CAPCOM here in mission control. We should have acquisition of signal from command module America. We'll come up with that line now.

AMERICA (mumbling) Hey, guess my heaters off.

CAPCOM Hello, America, are you there?

AMERICA Okay, we got REACQ (garble) now.

CAPCOM Okay, you're loud and clear.

CAPCOM Ron when it's convenient -

AMERICA Okay(garble) mag -

AMERICA Okay, go ahead.

CAPCOM Okay, on your present page there, the UV solar atmosphere PAD at 160:38.

AMERICA Ah ha, I have it.

CAPCOM Okay, it's T-start of 160:41:22. T-stop is 161:26:47, and a remark that goes with that, you don't need to write this down but, the T-start time is bias 10 seconds prior to when we really think sunset will occur. If you, visually, - okay, my mistake it's - the time is 10 seconds after sunset, but if see sunset visually, you can go ahead and proceed with the UV cover open as soon as you see it. But we'd like you to close the UV cover exactly on the T-stop time, as written, over.

AMERICA Okay, let's see, I'm with you. We'll make sure it gets closed at 61:26:47 but we can open it as soon as sunset comes, okay?

CAPCOM Right.

AMERICA Even though we haven't started pitching yet.

CAPCOM That's correct and do you want to read back the start time?

AMERICA Start time is 160:41:22, is that correct?

CAPCOM That's correct, 41:22.

AMERICA Okay.

CAPCOM Okay, go to 161:34.

AMERICA 161:34, okay.

CAPCOM Okay, and the old standard map camera laser-altimeter cover OPEN, cross that out. Couple lines below at 36, cross out mapping camera extend, and then turn the page.

AMERICA Got 'em.

CAPCOM In fact, turn 2 pages to 163:31.

AMERICA 31, okay.

CAPCOM At 163:31 write in verify all command module VHF OFF.

AMERICA 63:31, verify all VHF OFF, okay?

CAPCOM Okay, that completes it.

APOLLO 17 MISSION COMMENTARY 12/13/72 12:50 CST 159:57 GET MC-630/2

AMERICA Goody, I got zodiacal light coming up there sometime. One filter and all that. Oh, I started to say, when I was coming across Akin, of course Akin itself was down in the shadow and the Sun was really shining on window 3, I took the first one at 56 at a 15, second one 56, 5.6 I mean at a 30th and the third one at a 1/60th and the fourth one at a 1/25th and the fifth and sixth ones I took off to the north, looking off to the north out of window 4.

CAPCOM Okay.

AMERICA And they were 5.6 at a 125th. I kind of doubt - it might work, but there was sure a lot of glare on the window. If it could get through that glare, well then we got it made.

CAPCOM Roger.

AMERICA Oh, the other thing I was going to tell you was that -

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/13/72 13:00 CST 160:07 GET MC631/1

CHALLENGER (garble) was it magazine Quebec Quebec.
I finished that one on 114.

CAPCOM Okay.

CHALLENGER On that pass, there.

CHALLENGER I don't know who took my water jug
but it's gone.

CHALLENGER Okay, Onboard (garble) been purged
enough. I guess we'll turn that off.

CHALLENGER The big filler on here. I always leave
the hose and everything disconnected. Stick it back behind
this rock bag. Afraid I'll kick it. Break it off.

CHALLENGER You know, speaking of those rock bags.

CHALLENGER I had unzip those and Blow the air out of them
every night. Wake up the next morning and they're full of air again
justlike two big balloons down there.

CAPCOM How about that.

CHALLENGER (laughter) I'll honor it.

CAPCOM You can use one for the pillow you've
been missing.

CHALLENGER (laughter) That's a thought. You could
do that.

AMERICA And Houston, America. If FAO's got his
finger on the NIXON magazine - next Hasselblad mag - I'm going
to use - save me looking it up here.

CAPCOM Okay, I'll ask him.

CAPCOM Ron, I - your scheduled to use Mike Mike
next.

CHALLENGER There's my water.

AMERICA Mike, Mike. Okay.

AMERICA Thank you.

CHALLENGER Can you hear me sucking all the bubbles
out of my teeth?

CAPCOM No, we missed that pleasure.

CHALLENGER Good.

CHALLENGER Didn't want the squawk box to be too
good.

CHALLENGER Gee, we go to P00 in about 2 minutes.

AMERICA O phase is going to go right over
Proclus, I mean Picard, this time. Let's see If that darkness
disappears or if I can still see the change in the color
of it.

CAPCOM Okay, Ron. You can put the high-gain
to AUTO next chance you get and FAO advises that there's
no more optional film left on Mike Mike. Everything that's
left on Mike Mike is scheduled up. Over

APOLLO 17 MISSION COMMENTARY 12/13/72 CST 13:00 GET 160:07 631/2

AMERICA Okay, I'll buy that. You know you can even - a zero phase went right across Picard there you can still see the darkness on the west - east - on the east from 9 o'clock around to 6 o'clock as north as zero.

CAPCOM Roger.

AMERICA And, it's north of zero as you look at the crater then over about 1 o'clock there's some kind of a fault area in the side of the rim. And, that's another spot where the dark material breaks down into the rim and also out on the outer outside of the rim. And, then you have that same type of impression at about 11 o'clock you've got a black streak going down inside the rim and it widens out going out toward a little crater out there on the outside of the rim.

CAPCOM Okay, your scheduled to get a verb 49 going now.

AMERICA Thank you. Okay pitch is plus 12.0. 025 enter plus 341.20 enter. And a plus enter for zero yaw 622 (garble) 518 (garble) proceed.

END OF TAPE

AMERICA Okay, let's see, we're in AUTO so we can go 18 and 26 on the dials.

AMERICA Okay, we'll change over the seven to the eight 1 (garble) plus seven-vents open. Afraid so - water (garble) - must be stuff that's just frozen on the dump or something and then when the jets fired to it kicked it loose.

CAPCOM Roger.

AMERICA Maybe that's the particles of combustion burning.

AMERICA Minus 05 degrees, 1/2 a degree deadband, 00 there, there or not, I'll try it.

CAPCOM Ron, this is Houston. Check noun 79 again, we think you might have loaded it R1 and R2 negative, that's the way it looks down here anyway.

AMERICA Okay, I'll check that.

PAO This is Apollo Control at 160 hours 24 minutes switching now to Air-Ground 1 for the initial wake up call to the crew of Challenger, asleep at this time on Taurus-Littrow. Command module America still has some 47 minutes remaining in this frontside pass. We'll stand by for the wakeup call which should be beamed up in about a half a minute or so.

(Texas Aggies Fight Song)

SCHMITT I want you to say it first.

CAPCOM Hello, there, Challenger. The Gold Team Flight Director picked out the morning selection, and he says that if you can find some maroon dirt today instead of orange, you'll probably get a lot more cooperation out of him.

SCHMITT I figured the Gold Team might do that. You know I've woke up to a lot of pleasant thoughts, but never to an Aggie before.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/13/72 13:20 CST 160:27 GET MC-633/1

CHALLENGER (garble) but never to an aggie before. Hey Gordo, don't forget I'm a gold - I'm a boiler maker.

CAPCOM Roger.

CHALLENGER I feel like one right now. Tell the Gold Team Flight Director we'll find - just about anything he wants today.

CAPCOM Okay, I'll do that. The Challenger looks as good as ever, no problems at all through the night.

CHALLENGER That's outstanding, how's America?

CAPCOM It's in the same shape, just clicking along. Ron's been up for a few hours now and really gathering up the data.

CHALLENGER Outstanding, Gordo.

CAPCOM Challenger, the name of the game today is to stay with EVA prep timeline. We're not going to talk much to you, we'd like - except to bug you a little, stay on your back to keep with the timeline if at all possible, we'd like to get out on time, over.

CHALLENGER Okay, Gordo, that's been our motive all along and we will stay with it. As of right now we're now 1 hour behind, is that correct?

CAPCOM That's affirmative, although if you stay on the normal timeline, that's fine with us. We don't need to gain any but we just don't want to lose any from where we're starting now.

CHALLENGER Yeah, understand, understand.

CHALLENGER Hey, how are you this morning?

PAO This is Apollo Control. The reference to Aggie has to do with the fact that the Flight Director, Gold Team Flight Director, Gerry Griffin is an alumnus of Texas A & M University. The wake-up music this morning was the Aggie war hymn, E-Pluribus Gig-Um, and Gerry proceeded to gig the crew with his own brand of music.

CHALLENGER Houston, Challenger.

CAPCOM Go ahead, Challenger.

CHALLENGER Okay Gordy, crew status is good, in case you hadn't noticed, and again I'm not going to - we haven't kept an itemized accounting of the food, there weren't enough blanks on the paper to do that, but we have ate - have eaten, pardon me, we have eaten just about everything in the various meals. I guess the shrimp was the only thing we didn't really eat, and we've been drinking a lot of water and all the juices and tea and stuff, so I think we're in pretty good shape there. The commander had a secondal last night and he slept 3 good, 3 intermittent hours. LMP had no medication and had 6 good hours of sleep. If you've got some lift-off time data, well I'll copy it.

CAPCOM That's affirm. Okay start with - for rev 38, time is 162:22:52. Rev 39 is 164:21:24. 166:19:55; 168:18:27; 170:16:59; 172:15:31; that should have been rev 43 and readback starting with rev 38.

CHALLENGER Okay rev -

END OF TAPE

APOLLO 17 MISSION COMMENTARY, 12/13/72, 13:40CST, 160:37GET, 634/1

CHALLENGER Okay, REV 38, 162 22 52, 164 21 24, 166 19 55, 168 18 27, 170 16 59, 172 15 31. And what is our present REV?

CAPCOM That's a good question. Let's see here. We're working on Rev 37. Ron just went by about 30 minutes ago on REV 37.

CHALLENGER Okay.

CHALLENGER Gordy, we're pressing on but if you've got any good word - like news and what have you where we are we'd appreciate it.

CAPCOM Okay, there hasn't been a lot of news but I'll read you what we've got. President - former President Truman is still holding on. His heartbeat, breathing and temperature all became unstable yesterday, but then he improved again. A Methodist minister in Kansas City said he's a rugged guy who's hanging in there and he's going to make it. The headlines were full of reports of the finding of orange dirt and the rest of your adventures yesterday. Internationally the U.S. and North Vietnam held intensified secret peace talks and Henry Kissinger prepared to return to Washington probably this afternoon, I understand, after a final session with Le Duc Tho. French press had a compromise within the works on the withdrawal of North Vietnamese Troops from the South. The Houston Rockets lost to Buffalo up in Buffalo last night. But the hockey team the Arrows took a 6 to 4 win over the Alberta Oilers. In - really that's about it on the news except maybe from the weather which finally broke. The cold front cleared out the drizzly rain last night and for the first time since you've launched - that I can remember any way - we've been able to look up and see the Moon directly. It's a pretty site as always. That's not much of a report but that's about all we have. Over.

CHALLENGER Okay, thank you. What's the date today?

CAPCOM It's Wednesday the 13th of December.

CHALLENGER Thank you.

CAPCOM Right now it's about 1:35 in the afternoon.

CHALLENGER Okay, just take a quick peek up there - I can't really see too much of North American Continent - South American Continent looks pretty good and it might be my eyeballs rather than the clouds up there but it looks like most of the clouds are up into the north central part of the southwestern or southeastern United States.

CAPCOM I have a satellite picture here and that's about the way it looks.

CHALLENGER Well, it's sunny and pleasant on the Valley of Taurus Littrow. And, Gordo, what is our Sun angle going out today?

CAPCOM I'll get you an answer on that. Couple of questions. First of all, the surgeon would like a Biomed rake and they were wondering how your hands feel this morning?

CHALLENGER Hands are in good shape, Gordo. No problem.

APOLLO 17 MISSION COMMENTARY 12/13/72 GET 160:37 CST 13:40 MC634/2

CAPCOM Okay, that sounds good. Sun is getting up there about 33 degrees now.

CHALLENGER Okay, we'll go a mild midleft and both PLSS's have been topped off.

CHALLENGER Gordy, the LMP isn't hooked up right now. He will be shortly. So stand by on the Biomed.

CAPCOM Okay. Okay, I have a few words on the Command Module trajectory that might be of interest, although it doesn't affect your procedures any.

CHALLENGER Go ahead.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/13/72 13:40 CST 160:47 GET MC-635/1

CHALLENGER Go ahead.

CAPCOM Okay, the command module orbit somehow is missing all the mascons and not degrading into circular like we thought it would, it's just staying where it was about 70 by 50, and so what we're planning on is an extra little maneuver about 1 hour prior to the normal plane change which will lower the command module altitude and the plane change mode to 60. This will be about 11 feet per second RCS burn, and then Ron will do the plane change at the normal time but it'll be little bigger than that we had planned, I think the last half was about 365 feet per second, for plane change and we checked the consumables that puts the RCS right on preflight line, he's been running about 4 or 5 percent above it. That will use up that pad there put him back to nor - nominal on RCS and on the FDS puts you right down on the CSM rescue redline. So, really no problem, in good shape, consumable-wise. Over.

CHALLENGER Okay. Sounds like a good rendezvous posture.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/13/72 13:57 CST 161:04 GET 636/1

PAO This is Apollo Control at 161 hours
13 minutes. America has gone behind the Moon. Ron Evans
in his 37th lunar revolution. Crew of Challenger having
breakfast now.

END OF TAPE

APOLLO 17 MISSION COMMENTARY, 12/13/72, 14:07CST, 161:14GET, 637/1

CHALLENGER Okay, Houston have you got any updates to the EVA cuff check list?

CAPCOM No, I don't think there is, Jack, although I do have a write in for the lunar surface checklist. And one that you really don't need to write in on the prep card. Over.

CHALLENGER Go ahead.

CAPCOM Okay, page 5-10 on the lunar surface checklist. Reason for this change is to prevent cabin pressure from increasing. It got up to 5.7 yesterday. And it will also prevent water sep spindown like happened yesterday, if you happen to have the return hose blocked against the wall outlet there. The change is to write in in the upper left corner 5-10, just prior to suit iso actuator override, suit disconnect. Write in pressure REGS A and B to egress. And then down 5 lines where it says cabin gas return egress change it to cabin gas return auto. Verify. Over.

CHALLENGER Okay, Gordy, at the top of the page, REGS A and B to EGRESS and then 5 lines down cabin gas return auto verify.

CAPCOM That's right and the only other change I have is - has to do with matching - just like yesterday matching the purge valve to the OPS's and maximize the OPS capability and we can just call you when you get to that point - it's - or if you want to write it down - you need 211 and Geno needs 208.

CHALLENGER Okay, we've got that.

CAPCOM Okay, that's all.

CHALLENGER Okay, Gordy I guess we play the cuff checklist just as planned, with the exception of the bag numbers which have changed, the collection bag numbers. I have more or less repaired the sample bag holder on my camera. It's taped on there pretty well with good tape, believe it or -

END OF TAPE

SCHMITT (garbled) off the (garbled) bag. I don't know that we have any other outstanding hardware problem. I think in terms of sampling Gene and I will try to shift the emphasis in the mantle area to fragments that are different from the gabbros that we've sampled fairly well I think up to now that presumably subfloor materials. You might pass that word on and see if they agree with it.

CAPCOM Okay, Jack, we copy that. And Jack, if you are at a convenient place, sit and listen while you're doing some of your stuff. Let me read up some of the planning for EVA 3 and the summary of what we think we have so far.

SCHMITT Go ahead.

CAPCOM Okay. I'll read here from this thing just verbatim. Says: EVA 3 continues to follow essentially the nominal premission plan. Main objective continues to be the North Massif, Station 6, 7, Sculptured Hills and Van Serg Crater. Due to extensive observations of the dark mantle and plain subfloor unit on EVA 1 and 2 particularly at report Station 5. The relatively, the relative part at Station 10 is reduced, so Station 10 becomes a flexible station as time allotment is a reserve, possible providing more time at the early station if desired. However, mantle and block sampling at Station 10 are important objectives. Luch, pack, and strength are not nearly as tight as they were yesterday guys, and so we can be more flexible and reshuffle station time as we need. It probably won't be coming up again spots and want (garbled) like we did at Station 4. Close-out time at the LM has been increased by 20 minutes to make the close-out less rushed and to allow for potential ALSEP trouble shooting. It is currently planned to take this time from Station 67. But if 67 requires more time when we get there we can borrow from one of the other stations. I guess the particular Station 10 probably. As the initial activity we going to take explosive package 5 with us and stick it under the LMP seat and I'll remind you in real time when we get down on the ground on that one. And No. 5 precount over the deploy at Station 10 and again I'll remind you about that in real time so don't start to bother to right it in on your checklist. Plan traverse to proceed as normal. We're expecting to spend about an hour and 20 minutes at Station 6 and 7 and the suggestion is that we may end up wanting to spend that totally at the split boulder division 6, but of course the option still exists to visit more than one place and sample of the boulders if it seems feasible and attractive and desirable. They are suggesting additional 500 mm photographs especially if it seems we can use those as document tracks and sources of documenting the sample boulder. Perferably Station 6 and 7. We are continuing to hold the nominal

47 minutes at Station 8, there's 8A and we still that's as good as place as any to sample the Sculptured Hills. Station 9 still nominal 30 minutes, but in view of the similarities therein to Station 4 we are anticipating a possible desirable to remove time from Station 10 to enlarge Station 9, but that will have to be a real time decision based on what we find at Station 9. Station 47 - Station 10 continues nominal. We're still interested in sampling the blocks and also interested in trenching the (garbled) so that we can say something about the dark mantle, light area relationship. And perhaps the nominal coring. We are going to employ EP5 there and other than that they're basically the same. If we have the time during that close-out and you'll know we have enlarged the close-out somewhat of the LM based on our experience the last two nights, particularly for dusting, but also, if time permits in that time we might try and get the - use up the extra double core, if there is one, in a dark mound near (garbled) trenching near the LM. But that's only if time permits at the very end before the consumables run out. They want to call attention to two particular things here. One; since you guys really haven't gotten any very big rocks so far, they are recommending they say here and I quote: "The value of large individual samples have been demonstrating. We recommend that several football size samples of a uniform igneous rock be collected at Station 9 or 10. I'll pass that on as that and another point of interest is the one - wanted 20 mm size section of the regolith, the dark mantle, the pathology than any observations or collections you can make pertinent to that. It will be of interest in trying to determine the relationship of the dark mantle, the subfloor you see gabbro underneath. Two short questions which I'll ask which I hope you can answer in just a very few words. One of them is a yes and no answer.' One, we - they can't find the geophone photos, they're going to be called out in the transcript. There is probably a little bit of garble at that point and the back room will be very happy if you could say once and for all, Jack, that yes you did get the geophone photos. Over.

SCHMITT

Yes.

CAPCOM

Roger. And the second one concerns the quarter pound charges deployed on the way in last night. Two questions on that. It appears to us from your voice transcript that we weren't fast enough on it at the time that that may be deployed closer to the ALSEP than the one you deployed on the way out and we'd like your impression on that and No. 2, you mentioned that you placed it in the depressions, you had some feeling about the depression in terms of how much of a danger that bomb - charge might place

to the ALSEP when it goes off. If the depression is any sort they're probably pretty well protecting the ALSEP. Any comment on those two questions. Over.

SCHMITT Well, the second one is not in a major depression. But it is a, maybe a - little ditch, maybe a third of a meter deep. I imagine it will help a little bit. That's why we picked it. Just a second.

CERNAN I'm not sure we understand your first question.

CAPCOM Okay, we have a feeling that when you

CERNAN Bob, don't you have the mileages?

CAPCOM Roger, but there's again some confusion on that.

CERNAN Didn't you checkpoint that?

CAPCOM Yeah, and those mileages also seem to indicate that we had the call out, remember you drove back by and said you saw the flag and then you said you actually saw the charge itself first. And it was some time after that you think you deployed the charge. We have the opinion from both that and the mileage you probably deployed the second charge closer to the ALSEP than the first one. Do you have any further feel for that?

CERNAN Ah, yah, I remember saying that, but that's when I did a big 360 and Jack was out of film and I just lined up to take that picture with him up in the background. And when I said hey, I saw the charge first. I was really don't take that comment too strong.

CAPCOM Okay, copy that.

CERNAN As far as position of it. Bob, we're I - we're looking for 'em out there now. As a matter of fact we can't see 'em from here.

CAPCOM Okay, we'll let it go at that. And that's all the questions and comments we have on today's traverse. We'll have a few real time things on the surface which I won't bother you with. A possible fix to the thrust electrical properties and a possible trip back to the surface perimeter which is still having it's problems. But I'll talk with you guys in real time on those when you get on the surface rather than bothering you with them now.

CERNAN Hey, Bob, how far should that large charge be from the ALSEP?

CAPCOM They want it about 300 to 400 meters.

CAPCOM And Gene, you got 0.2 for range.

CERNAN Bob, I -

CAPCOM Coming back to the LM. And I guess the question would be: Did you every go through zero on the way back to the LM? If you are at 0.2, we think 092 was the

bearing, then the LM is right where we thought it was and we were just a little confused by our distances. They don't quite hold together.

SCHMITT Naw, I don't think I ever went through zero because I initiated that myself.

CERNAN And no I didn't go through zero.

CAPCOM Okay.

CERNAN I'm positive.

CAPCOM We copy that.

CAPCOM Okay, we'll work on that.

CERNAN Is this something effect - it's something to think about. It's not that far out there. You know if there is any question about that damaging the ALSEP it -

SCHMITT It's just hard for us to recall how close they were. And we sort of thought you had them pin pointed for us. But if you want it 3 to 400 meters, you might think about a late -

CAPCOM No. We thought about that. We don't want to do that.

CERNAN (garbled)

CAPCOM No, we don't want to do that so we'll take care of it. Don't worry about it now. That's all we have. Press on with the (garbled)

SCHMITT Bob, I can -

SCHMITT Hey, Bob, this is Jack, I can see the charge with the binocular. It's out almost behind a rock between us and the LM, but I can see it. I mean a rock between it and the LM. I can't give you any idea though how far it is.

CAPCOM Okay.

SCHMITT Know it's the one off the left.

CERNAN Hey, Bob, let me say again. I think we ought to emphasis the exotic looking fragments on the dark mantle and we ought to try to make sure that we look at a variety of rocks from the North Massif. I think we saw the major rock types on the South Massif yesterday, but we really didn't spend a lot of time ranging along the front there to verify that completely. The other comment on the 1 to 20 mm size fracture - there isn't an awful lot of that in the dark mantle. That's one of the striking tec ---

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/13/72 GET 161:35 CST 14:28 MC639/1

CHALLENGER We're going to spend a lot time ranging along the front there to verify that completely. The other comment on the 1 to 20 millimeter size fraction, there isn't an awful lot of that in the Dark Mantle. That's one of the striking things about it. It's, in that size range, there just isn't very much, except chips of what appear to be comparable albedo anyway of the subfloor gabbro. We'll keep our eyes on it.

CAPCOM Okay. Copy that. And we'll talk, I'll talk with the back room about stations 6 and 7. We'll get with you on that when you get there. And press on.

CHALLENGER Houston, Challenger. I was Biomed right there for about 10 minutes, in case you're curious.

CAPCOM Okay, Jack, and it looked good.

CHALLENGER Okay, Bob, I've got them both, and the last one we deployed which I think was the eastern one, the eastern most one, is definitely farther out than the first one we deployed. And this distance is awful hard by looking at Jack's geophones. I got to give you at least 300 meters, Bob.

CAPCOM Okay, Geno. Bob's in the back room. I'm sure they're listening and we got that.

CHALLENGER Yes. I've got both of them with the binoculars now and the second one, the last one we deployed is quite a bit farther out than the first one.

CAPCOM Okay, I think that's what they want to hear.

CHALLENGER Gordo, I guess it's half again or maybe even twice as far away as the, as the first we deployed. So, we're going to forget it.

CAPCOM Okay, Geno. That sounds good.

CHALLENGER And, Gordo, I'm going off the air also here for about 10 minutes. It'll speed things up a little bit.

CAPCOM Okay. Fine.

PAO This is Apollo Control at 161 hours 44 minutes. We're 1 hour behind the Challenger timeline in the Flight Plan. Barring further delays, we would anticipate the start of EVA at 163 hours 40 minutes or 4:33 PM, Central Standard Time.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/13/72 CST 14:38 GET 161:45 MC640/1

CHALLENGER Houston, Challenger. The air's now back on.

CAPCOM Okay, CDR, you're a lot clearer.

PAO This is Apollo Control at 161 hours 53 minutes.

The estimated net weight of the lunar surface samples collected on the first two EVA's totals 104.3 pounds. The breakdown is 29.1 pounds on EVA-1, 75.2 pounds on EVA-2.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/13/72 CST 14:48 GET 161:55 MC641/1

PAO This is Apollo Control at 161 hours 59 minutes.
We have acquired America on the front side of its 38th lunar
revolution. Ron Evans is having a meal. And, the infrared and
ultraviolet SIM bay experiments are being performed.

PAO America's orbit now is 69.1 by 53.8 nautical
miles.

END OF TAPE

APOLLO 17 MISSION COMMENTARY, 12/13/72, 14:58CST, 162:05GET, 642/1

CHALLENGER
how do you read?
CAPCOM

Okay, Houston this is the LMP from Challenger,
Jack, you are loud and clear.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/13/73 CST 15:08 GET 162:15 643/1

PAO This is Apollo control. Ron Evans is
over the landing site at the present time taking some pictures.

END OF TAPE

APOLLO 17 MISSION COMMENTARY, 12/13/72, 15:18CST, 162:25GET, 644/1

CHALLENGER Okay, Houston I'm ready for battery management and the EV batts are at 37.2. And I'm going to power amp primary and GM high.

CHALLENGER Hello, Houston. How do you read Challenger?

CAPCOM Okay, we have high bit rate now. You're go on the battery management.

CHALLENGER Okay.

CHALLENGER Okay, we've got that. We're ready for power amp up and PCM low.

CHALLENGER Bob, CDRs PDR or PRD is 170 43. 170 43.

CAPCOM Copy that, Gene.

CHALLENGER And Jack's is 241 38.

CAPCOM Roger, copy that.

CHALLENGER Okay, Houston, CDR's OPS is 59 000, LMP's is 61 000.

CAPCOM Okay, copy that. Very good.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/13/72 GET 162:35 CST 15:28 MC645/1

CHALLENGER Gordy, the forward hatch is unlocked.
CAPCOM Copy that.
CHALLENGER I'm sorry Bob.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/13/72 CST 15:38 GET 162:45 646/1

CHALLENGER Bob, CDR is starting on with the PLSS
donning.
CAPCOM We copy that, Geno and we copy the for-
ward hatch unlocked right?
CHALLENGER Yes, sure did.
CAPCOM Challenger, Houston. We've lost downlink
with you guys. We've got a very weak signal. You might
check your configuration up there please.
CAPCOM Challenger, Houston in a bind. We've
lost downlink with you please check your comm configuration,
over.
CHALLENGER Roger Bob, we're checking.
CAPCOM Okay Challenger. We have you back loud
and clear.
CHALLENGER Okay Houston. Okay, it looks like I
might have hit the yaw knob on the steerable with the PLSS.
CAPCOM Okay, copy that.
CAPCOM Okay, and Jack if you want to check those
again for numbers it's pitch of 14 and yaw of 808.

END OF TAPE

APOLLO 17 MISSION COMMENTARY, 12/13/72, 15:48CST, 162:56GET, 647/1

CAPCOM Okay, and Jack did you want to check those again for numbers - it's pitch of 14 and yaw of 8 - 08.

CHALLENGER Bob, that doesn't jive with what my needles say. I have got a 20 and 50.

CAPCOM Leave them there - we'll check with you.

CHALLENGER That's minus 50.

CAPCOM Jack, this is Houston. What's your signal strength meter reading there on your high gain next time you get around to it.

CHALLENGER We're, at a 3.8. It's not quite as good as it was. We had about 39 I think.

CAPCOM Okay, Ed thinks maybe you're on a side lobe and he suggested a pitch of 14 and a yaw of plus 8. Over.

CHALLENGER Okay, I'll try it.

CHALLENGER Bob, I'm in Auto right now and it's holding at 3.8 with those numbers that I gave you. I can't - if I go to the numbers that Ed suggests - I get down to about .3 and it won't lock up in auto.

CAPCOM Okay, we noticed that. Let's just leave her there, please. Go to slue please.

CHALLENGER GARBLE. ATR B is received. On 16 your breaker open and connect to PLSS comm. Okay, connect the PLSS COMM and then put your breaker in.

CAPCOM Okay, your PLSS comm - audio breaker closed. Okay PLSS PTT main light verify and go mode A.

CHALLENGER Okay.

CAPCOM I got you. You're getting the tones of event flag, press flag and 0 flag.

CHALLENGER Okay.

CHALLENGER Call Houston and give them your 02P.

CHALLENGER Okay, Houston, this is the LMP on Mode A and my oxygen is 94

CAPCOM Copy that Jack, you're loud and clear.

CHALLENGER Okay, I'm getting a little bit of a squeal on the initiation of my transmission.

CAPCOM Okay, I hear that too but it's about clear here.

CHALLENGER Okay, I'm going mine open.

END OF TAPE

CHALLENGER I hear that too, but it's not clear here.
Okay, I'm going. Mine open?

CAPCOM And LMP (garble) looks good down here.

CHALLENGER There is the tone, there's a press flag and a vent flag. And O2. Okay, okay, I cannot hear Houston, but Houston, this is CDR with 91 per cent.

CAPCOM Roger, CDR. And LMP, we read the CDR loud and clear. We have good LMP medical data.

CHALLENGER Okay, you're loud and clear and you've got good data on me.

CHALLENGER Okay, you go B and I'll go A.

CHALLENGER Okay, going to B.

CHALLENGER Okay, how do you read me.

CHALLENGER You're loud and clear. Houston, this is the LMP in Bravo. How do you read?

CAPCOM Roger. We read the LMP loud and clear.

CHALLENGER Okay, Bob. And how me?

CAPCOM Read you loud and clear also, Gene. And we have good medical data on you Gene.

CHALLENGER Okay, Jack, let's go AR.

CHALLENGER Okay, going to AR.

CHALLENGER Okay, Houston, how do you read CDR?

CAPCOM Loud and clear on AR.

CHALLENGER And the LMP?

CAPCOM Also loud and clear on AR.

CHALLENGER Okay, Jack, squelch VHF-B full decrease. Decrease. Okay, at 16 our LCG pump is closed, at 16 cabin repress closed. Verify.

CHALLENGER That's verified.

CHALLENGER Suit fan LMP open and suit fan number 2 opened.

CHALLENGER Open and open.

CHALLENGER Okay, we should get a light in about 1 minute.

CHALLENGER Stand by for that. Okay, suit gas diverter to verify.

Pull egress.

CHALLENGER Okay, pull egress.

CHALLENGER Cabin gas return egress.

CHALLENGER Okay, Houston. You want us to go by the checklist now on the ECS system?

CAPCOM Stand by. Roger, as per the checklist.

CHALLENGER Say again. You didn't come through.

CAPCOM Roger. As per the checklist.

CHALLENGER Okay, egress on cabin gas return.

CHALLENGER Okay, that's suit gas diverter to egress, cabin gas return egress, egress.

CHALLENGER Egress and egress.

CHALLENGER And suit circuit relief auto.

CHALLENGER Auto.

CHALLENGER Okay, OPS connect you first. Suit isolation.
Activate override, suit disconnect.
CHALLENGER Okay, that's done.
CHALLENGER Your hoses are stowed?
CHALLENGER They're stowed.
CHALLENGER Okay, connect your OPS hose, and I'll get you a
number 211.
CHALLENGER Let me turn around.
CHALLENGER Okay.
CHALLENGER That'll do it. Keep poking this water hose.
CHALLENGER 211 is yours.
CHALLENGER 208 is mine.
CHALLENGER Okay, pin is closed. You're in low flow.
CHALLENGER Believe it or not, it still works.
CHALLENGER You have one?
CHALLENGER Yes I do.
CHALLENGER Are you through with it?
CHALLENGER I think so.
CHALLENGER Right now. (garble) I can get down there,
if you can't Jack. I can reach it. I got it, I can reach it.
Okay, let's get your OPS hose. OPS hose. OPS hose, it's way down
here. That's your water hose. Here's your OPS hose. Now, let's
get the dust cover on it. OPS hose is going in. I verified its
locked and the lock lock is in. Cover is up and we'll take another
look at them.
CHALLENGER Okay, we got the master alarm.
CHALLENGER Water set (garble) 3 amps. Sluggish one.
CHALLENGER Better see if it's lock, and locked, and you're
on, the, let's see you're on low flow. Pin is in and everything's
locked.
CHALLENGER Okay. Return valve close lock, it's all
off, it's all turned off. Diverter valve vertical.
CHALLENGER Okay, you want to vertical, pick up my OPS
hose. It's your OPS hose time.
CHALLENGER I not sure it makes any difference.
CHALLENGER Okay, over and locked. And dust cover. Veri-
fy.
CHALLENGER Okay.
CCHALLENGER And the COMM?
CHALLENGER Okay and that one's locked. Verify.
CHALLENGER PLSS purge valve and it's number 208 I hope.
CHALLENGER No. You wanted 211.
CHALLENGER No. I wanted 208.
CHALLENGER I want 208 and you want 211.
CHALLENGER No. I'm sorry. That's what I copied down.
CAPCOM Roger. 211 for the LMP.

CHALLENGER Verify that will you Bob?
CAPCOM 211 for LMP.
CHALLENGER That's right. Okay. That's what he's got.
CHALLENGER Somehow I copied the wrong one. Okay, give
me 208. Same thing we had yesterday.
CHALLENGER Well, I didn't remember from yesterday. And
that's what I thought Gordy said.
CHALLENGER Okay, that's in, locked. Verified.
CHALLENGER On low?
CHALLENGER On low and the pin's in. Okay, check this.
CHALLENGER Good. Okay. We just had our drink. You can
turn drink descent water off.
CHALLENGER Okay, descent water is off.
CHALLENGER And my hand all prepared. You get
the scissors and the ETB. I think we finished up with that.
CHALLENGER They're in there.
CHALLENGER Okay. Position mikes.
CHALLENGER Okay.
CHALLENGER Okay. Here we go again, let's take a look at
it. PLSS fan will come on, don helmets and LEVA's drink bag
position, lower EV protective visor, and secure tool harness strap,
and we'll verify the ... Let's verify the following, then we'll
go ahead and put your PLSS fan on and get your helmet and you can
put mine on.
CHALLENGER Okay, going through 1 more time. (garble) con-
nector and it's locked. And your OPS is locked, covered. You don't
have water yet. Exhaust is locked, covered. Inlet is locked, covered.
Purge is locked and low.
CHALLENGER Okay, and vertical on diverter valve.
CHALLENGER That's right.
CHALLENGER Okay, let me take a check. COMM is locked and
covered. OPS is locked and covered. This exhaust is locked and
covered. Inlet is locked and covered. You're vertical. Purge
valve is locked and low.
CHALLENGER Okay, let me get your helmet here.
CHALLENGER Let's look at one thing here Geno. Let me
put this up here. Get it out of the way, (garble). You want to
look in it. That Gene.
CHALLENGER Do need to check it.
CHALLENGER That's what my luck's like.

END OF TAPE

APOLLO 16 MISSION COMMENTARY, 12/13/72, 16:07CST, 163:14GET, 649/1

CHALLENGER That's what - looks like. GARBLE my gloves are stiff too that will come if you pull and if need be I can pull it down for you. Okay. GARBLE up and out of the way. Okay, as soon as I get this overhead you can put your fan on. Okay now let's watch out for all your paraphernalia there. Okay pull - pull that stuff away from there.

CHALLENGER Not, yet. Let me undo this. I just want to make sure I get my fingers on this thing, and make sure it's locked. Can't get it all.

CHALLENGER Do it. There that got it. Okay, that should have it.

CHALLENGER Get your fan here on a minute. Okay, you got your fan on.

CHALLENGER Fan's on.

CHALLENGER Good.

CHALLENGER Okay, I'm going to verify it right now. Your helmet is locked. It's aligned. Aligned, locked. Locks are down in back, your lever is locked. Your fan's on, right?

CHALLENGER Un huh.

CHALLENGER Okay, let's pick mine up.

CHALLENGER Okay.

CHALLENGER Okay, you ready?

CHALLENGER Un huh.

CHALLENGER You can feel that rim all the way around. Wait a minute.

CHALLENGER GARBLE

CHALLENGER Now that's fallen down again.

CAPCOM And Geno, we don't see your fan on yet.

CHALLENGER It'll come on Bob. There it's locked.

CHALLENGER Okay are your gage marks marked.

CHALLENGER Well. They are now.

CHALLENGER Okay.

CHALLENGER Got your alinement only.

CHALLENGER Okay Bob my fan's on. It is locked.

CHALLENGER You did fine. Good.

CHALLENGER Okay.

PAO This is Apollo Control at 163 hours 17 minutes. We've picked up about 10 minutes on the timeline. Now estimate EVA starting in elapsed time of 163 hours 30 minutes, approximately 4:23 central standard time.

CHALLENGER I wiped out for DBA detail and then you can don your gloves.

CHALLENGER Okay.

CHALLENGER Okay you turn that way and let me turn this way.

CHALLENGER Okay, Jack, I'm going to turn these lights

off.

CHALLENGER Okay.

CHALLENGER Now, you go.

CHALLENGER Okay.

APOLLO 17 MISSION COMMENTARY, 12/13/72, 16:07CST, 163:14GET, 649/2

CHALLENGER EVA details wiped up.
CHALLENGER Okay your in line heater is going to come off.
And the breaker is out.
CHALLENGER Okay.
CHALLENGER Okay, I'm ready except for LCG pump - LCG
pump.
CHALLENGER Okay, leave it on. We can don our gloves
now.
CHALLENGER Okay.
CHALLENGER Okay, right glove is locked and verified.
Pin the wrist cover on there. On. That one's down. Air is very
dirty. Boy, I need a shave.
CHALLENGER Okay, I got all mine down. All set. Wait till
I can get my left hand. Got the left hand, let's see what I can
do with the right hand. Almost tempted to take those cover gloves
off today. I might take a look at that too. I hate to argue
with success. But I need that dexterity today.
CHALLENGER Bob, I don't know if you caught it yesterday,
a little interesting facet of the whole 2 EVA exercise with the
fact that I've already worn them.
CAPCOM Gene you dropped out there right in the
middle. Challenger, Houston, we - you dropped out there.
CHALLENGER Okay, Bob How do you read now.
CAPCOM Loud and clear, Gene.
CHALLENGER Okay, I hit the VOX switch on my audio panel.
CHALLENGER You did.
CHALLENGER Yeah, when I picked up my glove.
CHALLENGER Okay, Bob the only thing I said - little
point of interest I wore the RTV off the - not all of it - but
right through the bare metal on the hammer - sometime in the
previous 2 days. No problem it just interests me.
CAPCOM Okay, copy that and copy that you still have
your cover gloves on today, right?
CHALLENGER Yes sir. I tell you we have become very
respectful of the dust.
CAPCOM Copy that.
CHALLENGER Oh, yeah, cover gloves - we've also got the
wrist dust covers on too.
CAPCOM Roger, strike a blow for Mason jar rings.
CHALLENGER What's left of it - what's left of the cover
gloves. Okay, Jack, you're on. In lock.
CHALLENGER In lock.
CHALLENGER I got my thing out - I want to make sure I'm
locked again. Yeah I am. I took it off again. Well, I was.
Talking and you just do things - okay.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/13/72 CST 16:17 GET 163:24 650/1

CHALLENGER Don EV gloves cover okay PG (garble) no okay LGC codes required and LCG pump open. I guess you can open it. And disconnect the locas, LCG pump, water hose. Man I got a (garble) that's because I turned my oxygen on briefly.

CHALLENGER Okay. Okay pumps open. Turn around here and help you.

CHALLENGER You can take the water off. Water's off. are the pumps off? Okay, your waters off. Put that there for a minute. Okay, hang on. Okay, your in and locked. (garble). Okay.

CHALLENGER You're off. I'll lay that there. Where's your water? Here it is way over here.

CHALLENGER Hold on. Okay, now lock and the covers on. I'm going to zap my PGA wait a minute I'm biting here.

CHALLENGER Okay. Now let me turn this over. Okay.

CHALLENGER Okay, verify your PLSS's water min when you get a chance.

CHALLENGER Okay, that's verified. Did that a minute ago. Mines verified and your pump on. Okay, pump's going on.

CHALLENGER Mine's on pressure reg A, B to egress.

CHALLENGER Okay, they are egress. Okay, pressure integrity check.

CHALLENGER Ready?

CHALLENGER Let me give it to you. Awful lot of line there isn't there?

CHALLENGER Yes.

CHALLENGER Exactly what to do with it. Man, okay. Alright you happy.

CHALLENGER Yes, pressure regs A B to egress.

CHALLENGER They are egress. Okay, put your PLSS 02 water - no - on now mark it. PLSS 02 on.

CHALLENGER PLSS 02 on. Right?

CHALLENGER Okay, it's on. Okay, and mines on. We'll wait till it builds us up.

CHALLENGER PLSS flags clear at 31 and 34. 02 flag is clear at 37 and 40.

CHALLENGER Okay, I'm coming up. Hope the old suit integrity is just as good as it has been. I don't see why not. Coming up?

CHALLENGER Yes.

CHALLENGER About 35 now.

CHALLENGER Yes, me too. Okay, let me know when your up.

CHALLENGER I think I'm up I'm to three eight. Okay, let's see if we can't get these -

CHALLENGER (garble)
CHALLENGER I can't - okay mines off.
CHALLENGER Mine's off - mark it. We wanted a K
for one minute. Okay, I started at 383.
CHALLENGER Okay.
CHALLENGER That's not exactly where I was. Another
45 seconds to go.
CHALLENGER Okay. So far looks as tight as it
was yesterday.
CHALLENGER Another 30 seconds. That lunar dust is
a good sealant.
CHALLENGER Houston, CDR (garble) at 382 to 270.
CHALLENGER 270 -
CHALLENGER 37 - 370
CAPCOM Understand 370.
CHALLENGER Okay LMP was - LMP was 83 to 70.
CHALLENGER Okay, Jack you can get your 02 on.
CHALLENGER It's on.
CHALLENGER Okay, can you move to the left a little
bit to your left. I got to get in front here.
CAPCOM Okay your go for your -
CHALLENGER Okay, let me turn this over.
CAPCOM 17, you copy -
CHALLENGER Okay, stand by. Okay, Jack what time
we have to turn the checklist over?
CHALLENGER Okay, we've got to go for depress. On
60 cabin repress open and cabin repress valve closed.
CHALLENGER Okay.
CHALLENGER The breaker open and the valve closed.
CHALLENGER Okay, stand by. Can you give me a little
room -
CHALLENGER Let me - okay how's that?
CHALLENGER Okay. Okay, depress is open.
CHALLENGER Okay, now I want you to face the wall
over there and move in as close and I'll get the overhead
valve.
CHALLENGER Wait a minute I've got to close the re-
press valve. You got it alright. Okay, it's closed and I'll
get where I was yesterday. Okay, how's that?
CHALLENGER (garble) up in a minute.
CHALLENGER Okay, I've got to get my PLSS.
CHALLENGER Can you get it?
CHALLENGER Well, can't move.
CHALLENGER I can turn my back to the wall and you
might have a little more.
CHALLENGER Well, I think - I feel like I'm hooked
on something.

APOLLO 17 MISSION COMMENTARY 12/13/72 CST 16:17 GET 163:24 650/3

CHALLENGER Wait I can't turn either way - stay where you are. There - okay.

CHALLENGER Okay, the safety. Oh boy I'm glad I'm not an inch shorter. Okay, coming down Jack, you ready?

CHALLENGER Go ahead to 35.

CHALLENGER Okay, it's open.

CHALLENGER Okay, 45 - 4 stand by mark. Auto.

CHALLENGER Okay at 35. Can you read the checklist.

CHALLENGER Okay, I can. Okay, open auto 35 cuff checklist - cuff case did not drop below 46 it hasn't mines is good.

CHALLENGER When you put your hand down I can't read it.

CHALLENGER Okay, cabin is holding at 35, and suit circuit is locked up at 45 and PGA is decaying greater than 45. 46 okay. Okay, Bob I'm starting my watch.

CAPCOM We're go.

CHALLENGER Okay, you can go to open.

CHALLENGER Okay, it's open.

PAO EVA start time 163 hours 32 minutes 36 seconds.

CHALLENGER Open the forward hatch.

CHALLENGER Okay, my suits relieving - down to almost 15 now.

END OF TAPE

APOLLO 17 MISSION COMMENTARY, 12/13/72, 16:26CST, 163:34GET, 651/1

CHALLENGER Okay, my relief valve just seated at 53.
CHALLENGER Okay, where are we?
CHALLENGER We're at .5.
CHALLENGER I guess the next thing is to open the hatch,
huh?
CHALLENGER Yeah.
CHALLENGER I've got to get down now to five to here before
I can turn too well.
CHALLENGER Yeah.
CHALLENGER I'm going to let it come down a little bit
this time so I don't get down there, unnecessarily, it's got a ways
to go yet.
CHALLENGER About .3 now. At 2. I've got a tone
and it's water tone. Okay, I'm going to go after that hatch.
Can you slip to the right as far as you can?
CHALLENGER Got it - got to hold it until the pressure
decreases. All sorts of junk going out there.
CHALLENGER Okay, it's partially open.
CHALLENGER Okay, get your water in the can.
CAPCOM Okay, Jack, we'd like you to close REG A,
please.
CHALLENGER Close REG A, huh?
CAPCOM That's affirm.
CHALLENGER Okay, stand by. That's not an easy task. REG A
is closed. Gene, can you get my water?
CHALLENGER Yeah.
CHALLENGER Did you get in there. Okay, it's open.
CHALLENGER Okay. LMP's water is open. You got yours.
CHALLENGER Yeah, I got mine. Excuse me.
CHALLENGER Well, let's see.
CHALLENGER Okay, you got it open so I need to turn around.
See if I can back in and out of the way of the door.
CHALLENGER Say, Bob, what do you see in REG A?
CAPCOM Standby Gene, we're seeing high suit pressures,
stand by.
CHALLENGER How's suit pressure.
CAPCOM Okay, and about your -
CAPCOM Gene, you're go to go out and once you get out
maybe Jack can turn around and work on those a bit better. We're
seeing I guess the suit looks a little high in pressure.
CHALLENGER Okay.
CHALLENGER Okay, I'm looking at - at about 47 on the
suit loop right now.
CAPCOM Okay, we copy that.
CHALLENGER Okay, Jack.
CHALLENGER There you go.
CHALLENGER (garbled) Okay, turn.
PAO This is Apollo Control the reference is to the
suit loop in the Lunar Module - not to the pressure suits them-
selves.

APOLLO 17 MISSION COMMENTARY, 12/13/72, 16:26CST, 163:34GET, 651/2

CERNAN Okay. What does it look like to you?
SCHMITT Well, you're doing great, keep down. Just a little hang up on the DSKY. I didn't get mine.
CERNAN Arm down there.
SCHMITT They need to go to your left a little to clear the pruse. And your harness. There we go.
CERNAN Jack, did you see this - this is one of those cards -
SCHMITT Yeah, I saw that Gene.
CERNAN I'll put it right there.
SCHMITT GARBLE. Can you come forward just a little. That clip got away. Come towards me, in the cabin - there.
CERNAN Okay.
SCHMITT Wait a minute. Okay. I got it.
SCHMITT Hey you're in good shape.
CERNAN Okay, I'm on the porch. I'm still at 4.3.
Okay, I'm on the porch, Bob.
CAPCOM Copy that.
SCHMITT Okay, what do you want? What can I do for you, Bob?
CAPCOM Standby Jack we'll get a word to you in one minute.
CERNAN Okay, Jack in that - I guess that'll wait. Get my LEC ready for you.
SCHMITT Okay, I'm in the most normal OMNI right now.
SCHMITT Going to pressure down a little bit.
CERNAN Things norm, except a part of my nose itches I can't get to.
SCHMITT I'll give you the JETT bag any way, Geno, while they're thinking. I guess that's part of RD. Oh, yes, the JETTbag, Santa Clauses bag again. Yeah, exactly -
CAPCOM Okay, Jack we'd like to have you stand just a minute or so longer we're trying to keep track here of the suit circuit pressure and see if it is stabilizes or starts to drop. The One REG is just been intermittently leaking - we still haven't isolated it and we think we've got it shut off - but we're still watching it - so bear with us just a minute or so.
CERNAN I'm bearing, Bob? Hey what else -
SCHMITT I thought you isolated it last night.
CERNAN Okay, let me give you the ETB.
SCHMITT Yeah.
CERNAN Give me that and I'll be on my way work on a TGE.
SCHMITT Okay, got it.
CAPCOM Okay, Jack and how about taking the suit circuit release valve cycle adjust to open and then back to auto.
SCHMITT Okay, Bob, stand by. Suit circuit release going open in auto. That's done.
CAPCOM Okay, we'll watch it here for a minute and let you know.

APOLLO 17 MISSION COMMENTARY, 12/13/72, 16:26CST, 163:34GET, 651/3

CERNAN Okay, Bob, I'm going down the ladder.
CAPCOM Roger, Geno.
CERNAN Yep, still there, Jack. God speed the crew
of Apollo 17.
SCHMITT Good.
CAPCOM Hang in there Gene. Amen.
CERNAN Okay, Bob I'm on the pad and it's about 4:30
Wednesday afternoon, as I step out on to the plains of Taurus
Littrow beautiful valley. The first thing I'll do is I'll turn
the TGE on and I'll give you a reading.
CAPCOM Okay, we're ready.
CERNAN And I'm very much interested in my rover
battery.
CAPCOM And Jack you're go for exit and looks like
we've got it taken care of.
SCHMITT Okay, and I'm checking the circuit breakers.

END OF TAPE

CERNAN It's on and read, Bob it reads 222 262
207. 222 262 207.
CAPCOM Okay, I copy that Geneo.
SCHMITT Okay, get the visor down Geneo.
CERNAN Get the visor down - holy smoly. What
could be better to leave it up. Beautiful out here today,
Bob, we can look to the east for a change a little bit, anyway.
CAPCOM Okay, copy that Gene.
CERNAN A higher sun angle. Okay, I'll get
the crew battery changee out.
CAPCOM Okay, and as you walk by there, if you
walk by in the right spot the rover how about giving us a
set temperature read out, please.
CERNAN Set temperature is 103 degrees.
CAPCOM Copy, 103.
CERNAN 103 and the mirror is still clean.
CAPCOM Copy that.
CERNAN Well, let's see if I can change this
little baby now. Supposed to be simple. Bob, we have no
use for the old battery, right?
CAPCOM That's affirm.
CERNAN Okay, I'm on the porch and the hatch is
closed. Oh, don't that step into that.
SCHMITT Are you talking to me or you?
CERNAN I'm talking to me. Okay, that sounds
familiar and looks familiar. The old plain. And there lays
Taurus Littrow.
SCHMITT You want to get your antenna?
CERNAN Yes, let me get that -
SCHMITT I'll come over there.
CERNAN I'll get the TV - I've already got the
battery changed.
CERNAN There's the Earth right in the middle
of the antenna. Okay, verify mode 3 - I am in mode 3
the crew blankets are at 100 percent battery covers are closed
and the battery -
PAO TV coming in.
CERNAN Yes he's going to get my antenna.
SCHMITT I'm going to get these down.
CERNAN Yes, okay. Okay stay there.
SCHMITT I just try - I'm trying to.
CERNAN Okay. Okay, your antennas up. Wait a
minute. And I snap the snap. Okay. You don't need to do
that.
SCHMITT That's alright I can't get close enough
to you.
CERNAN Here you are.

APOLLO 17 MISSION COMMENTARY 12/13/72 CST 16:35 GET 163:43 652/2

SCHMITT Lean a little more.
CERNAN Antenna's up. Let me get the snap.
CAPCOM And 17, if you guys are interested your shadows will be eight feet long tonight.
CERNAN How many meters is that, Bob?
SCHMITT I'll draw it out - I'll step it out for you. You can measure it.
CERNAN Well, I don't know. Should I take my gloves off? I mean my cover gloves.
CERNAN Why don't you leave them on for awhile see where we're going. See what the boulder field looks like up there.
SCHMITT Well, I know what it's going to look like.
CERNAN No you don't.
SCHMITT The point is my hands will be much better off without them.
CERNAN Take them off then. Okay, battery covers are closed in tight. High gain is already oriented. Oh, they've even got TV I guess.
CAPCOM That's affirm.
CAPCOM But, Geneo when you push the Rover circuit breakers in how about giving us a battery temperature reading on the rover bat.
CERNAN Tell them what my batteries are reading if I can.
SCHMITT Well, let me see if I can do something else while I'm waiting.
CERNAN No, I've got it Jack.
SCHMITT I'll get the old set receiver.
CERNAN Well, Bob the battery one is 95 degrees and battery two is reading zero. So, we got a gauge failure. No, it's not reading zero it's off scale low.
CAPCOM Okay, read that - copy that. That's a real cool then isn't it? Okay, Jack if your going to worry about the sep stand by and don't do the sep until after you worry with the ETB and we'll get to you on that. When you get the ETB to the seat -
CERNAN Okay it's - 102 is the temperature.
CAPCOM Okay, copy that.
CERNAN Mark perimeter it's flashing.
CAPCOM Copy that.
CERNAN Okay, we'll take the big bag. I hope we can keep it on.
CAPCOM Okay, a couple of things on that Geneo. You might try tapping the thing to see if that loosens the dust. There's also the hook business on the inside of the

CAPCOM pallet that you could hook it on. Caution, if you open the pallet be careful not to knock the clamps off the fender. But, you can also reach over the pallet to put the big bag on.

CERNAN Okay, Bob we - I brushed and tapped it yesterday. I'm not sure we're going to have much luck with them.

CAPCOM Say again there, Gene.

CERNAN I brushed them and tapped them yesterday.

CAPCOM Okay, copy that. You might want to put the big bag on the inside of the pallet if you can't operate them.

CERNAN Okay. Okay, mag kilo goes on the 500.
Is that correct?

CAPCOM That's affirm.

SCHMITT Okay, I've got Mary and Frannie and Nancy and Donna and Bobby -

CERNAN Jack, I'm also going to keep this in there.

SCHMITT And Karen.

CERNAN Because it's too hard to get off the front end. We'll find a place for that in there. It's too hard to get off the front end. Okay, let's see big bag to gate dust brush too. Let me get that big bag on the inside of the gate if I can. Inside the gate or the pallet, Bob.

CAPCOM Inside the pallet, my fault there.

CERNAN The pallet.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/13/72 16:45 CST 163:52 GET 653/1

CERNAN Inside the gate or the pallet, Bob?
CAPCOM Inside of the pallet. My (garbled)
SCHMITT That - that's the pallet, the pallet -
CAPCOM And if you open the pallet, be careful
of the clamp. It probably is feasible we suggest you reach
across in front of the pallet. Reach across the pallet to
do it. Instead of to open it because of the clamp on the
fender.
SCHMITT It is not feasible. It's not feasible
to do that. I got to open it plus our hook is over center
Let me get something to work on that with.
CERNAN You know, Bob, how that pallet lock
hook can be out of the little C-shaped release in there?
It is.
CAPCOM Oh, Boy.
CERNAN I noticed that yesterday.
CAPCOM Jack, when you get done with the ETB then
you might save the gray tape out and use a little bit of that
on the set. When you get done.
CERNAN When are you going to do that?
CAPCOM We'll turn the -
CERNAN (garbled)
CAPCOM We'll turn both switches ON when you're
out at the set transmitter.
SCHMITT Well, the tape is in the CDR's seat and
it'll still be there.
CAPCOM No, we'd like to take the tape from the
CDR's seat and use it on the staff right now.
SCHMITT Okay.
SCHMITT You want me to do it or Gene to do it?
SCHMITT Why don't you do it since the tape is
there.
CAPCOM No, let's let Gene do it. Doesn't really
matter. Whoever wants to.
SCHMITT Okay, we'll get it.
SCHMITT Okay, Bob, the big bag is on the inside
of the - of the pallet.
CAPCOM Okay, we copy that.
SCHMITT I want it closed.
CERNAN Ah, the -
SCHMITT And I know why.
CERNAN This is a (garble)
SCHMITT Get rid of this thing. We don't need it
anyway.
SCHMITT Okay, opening and closing of the pallets
didn't interfer at all with those fenders.
CAPCOM Okay. Copy that.

CERNAN These aren't clamped down -
SCHMITT Now the tape - The big bag is on the inside
though.
CERNAN Yeah, but it's also in the way.
SCHMITT Okay, I got it.
CERNAN Sure is. Wait a minute. Wait a minute.
Don't close it.
SCHMITT Did I get it out of the way?
CERNAN I'll open it.
SCHMITT You dragged over that locking device.
CERNAN Okay, let me just see what we got to do
here.
SCHMITT Okay. Big bag. Dust brush. SCB to gate
mount 20 bag dispenser on the Commander's camera,
20 bag dispenser to the LMP, core cap dispenser to the gate.
CAPCOM Okay. And Jack, are you going up to take
the pan now?
SCHMITT Well, as soon as I finish up here.
CAPCOM Okay.
SCHMITT I'll do that.
CAPCOM Okay, and after you take the pan, we'd
like you to change the cosmic ray experiment. They're expecting
a little solar storm and before the rain gets on the cosmic
ray experment, they'd like to retrieve it. We'll leave it
in the ETB during the traverse.
SCHMITT Okay, after the pan. Alright.
CAPCOM Roger. It will just be a nominal retrieval and
we'll put it in the ETB. Copy the gate.
SCHMITT Okay.
SCHMITT Okay.
SCHMITT Okay, SCB. (garbled)
CERNAN 20 bag dispenser goes on my camera, when it get's
back. Short can under the LMP seat.
SCHMITT Okay.
CERNAN Jack, I'll just go ahead and mmount
some of these bags on your camera while I'm here.
SCHMITT Okay. Thank you.
CAPCOM Okay, and Gene, if you got time there with
the camera why don't we - when you get done with the camera,
how about getting some gray tape and we'll put you to work
on SEP for a minute.
CERNAN The SEP receiver?
CAPCOM That's affirmed.
CERNAN I'll be through. Let me finish SCB 7 here.
CAPCOM Okay, did you get Jack's camera fixed
last night? I didn't hear?
CERNAN Yeah, we did.

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CERNAN There is already one on the gate.
SCHMITT Do that one there/
CERNAN Okay, SCB7 to gate. 20 bag dispenser on
commander's camera, Will do it when I get back. 20 bag dispenser
on the LMP's camera core cap to gate one there, there's one
under the seat short cans under the LMP's seat. Okay I got to
put that cap dispenser on him, I got to get my rammer hammer,
SCHMITT Hey, Bob, what bag do you want on the
LMP?
CERNAN Do we have 8 here?
CAPCOM Standby. I think 8 went in either 4 or
6. No excuse me either 5 or 4.
CERNAN Okay, we'll put either 4 or 5 on that.
CERNAN Okay, I'll have to wait till he gets
back. What do you want? Or let me give you CB readings
and get that out of the way and then I'll work on your SEP.
CAPCOM Okay, copy that.
CERNAN Okay. 6 7 0. 027, 001, that's
670 027 001.
CAPCOM Okay, copy that, Gene. Thank you.
SCHMITT fender wrinkled up in the Sun a little
bit last night.
CERNAN Okay, mark, it. The cosmic ray is termin-
ated.
CAPCOM Copy that.
SCHMITT And Bob, I took two 5 foot stereo pairs
of the configuration.
CAPCOM Copy.
SCHMITT And we'll stick it in the ETB and just
leave it there.
SCHMITT Yeah.
CERNAN And in case you're wondering, and - so
you don't confuse it with the rock. It is in bag 106.
CAPCOM Copy that.
CERNAN Okay. What do you want done to the SEP?
CAPCOM Okay, take some gray tape over to the
receiver, Gene. And with reference to the fact that there is
some Velcro missing on the front there which hold the covers
down, we'd like to tape the two covers together - in the
middle there - you know where the two sides overlap in the
middle of the box. Tape those two together. A short piece
about an inch long should do it if they are clean.
CERNAN Well, I doubt if the tape will stick
because of the dust, but I might be able to go over it with
one piece to clean it and another piece to yape it.
CAPCOM Okay. And the question beyond that, is
there velcro to hold one of those flaps down or not?
CERNAN No.

END OF TAPE

CERNAN No.
CAPCOM Okay, both pieces of Velcro missing from both flaps, I take it.
CERNAN Yes. Bob, what happened was that the tape that held the lower Velcro on there apparently came loose, and it stuck to the upper Velcro.
CAPCOM Okay. I understand that. In that case, we'd like to take a piece of tape and tape the cover down to keep it closed when it's not -- when it's supposed to be closed. The feeling is that if the cover flaps partly open you may get specular reflection off the inside of the Mylar down on to the mirrors causing it to heat up during the drive when it's supposed to be closed.
CERNAN Okay, we'll give it a try.
CAPCOM Okay, thank you.
CAPCOM And, Jack, if you're done, you might go rescue EP number 5 from the footpad, and we'll put it under the LMP's seat.
SCHMITT Well, be a lot of other things under there. Okay. I'll rescue it, and we'll see where the best place to put it is.
CAPCOM Okay.
SCHMITT Hey, I got -- I got bags on you. I got bags on your camera, Geno.
CERNAN Okay, thank you.
CERNAN Okay, we're going to put those two bags on the rear there, on our PLSS's?
CAPCOM One of them will go --
CERNAN Okay.
CAPCOM -- those two on -- or one on the LMP seat will go on the CDR, the one with all the stuff in it.
CERNAN Yeah, I got core tubes in seven here, Jack. We'll put either one of those --
SCHMITT Okay.
SCHMITT So, I can't put the charge under my seat.
CAPCOM That's affirm, I think, Jack, once you get SCB-7 out of there.
SCHMITT Yep. I feel like a kid stuck to taffy.
CERNAN Sure is strange not to see some fine-grained rocks out here. Seen a couple, but certainly not very many.
CAPCOM Copy that.
CERNAN That rock that you picked up at --
SCHMITT What are you doing up there? Okay.
CERNAN Bob, that'll hold it down. I hope it solves the problem.
CAPCOM Roger, and so does Dr. Strangelove.
PAO The storm reference is a minor solar flare which represents no danger to the crew, but could affect the very sensitive cosmic ray experiment.

CERNAN Well, probably not any more than we would like we would like to see it solved. Bob, -- nothing.

SCHMITT Gene, your bag's going to have two lowers and one upper.

CAPCOM Did you re-sort things there, Jack?

SCHMITT What's that?

CAPCOM Did you re-sort things in SCB-7? I was --

SCHMITT I said I got -- Bob, I just -- Go ahead.

CAPCOM Okay. Our understanding was there are two uppers and one lower in Bag 7, and two lowers under the LMP seat. Did you re-sort things there?

SCHMITT Do you want -- how do you want them?

CAPCOM Doesn't matter to us. I just wanted to make sure that we know what you are so we don't let you get away too far with two uppers and a lower. Two lowers and an upper is certainly better than two uppers and a lower.

CAPCOM As long as we know what it is.

SCHMITT Okay, it's two lowers and an upper.

CAPCOM Got that.

SCHMITT Two lowers and an upper.

CERNAN Man, I'm confused.

SCHMITT Okay. When you're ready, I'll configure you.

CERNAN Okay, let me get this on you first since I got --

SCHMITT Get it? And, I'm going to ask you to turn 1 -- 180 degrees because you're up on a hill.

CERNAN I'll never be able to do it.

SCHMITT (Garble) Down in a hole now.

CERNAN That's beautiful.

SCHMITT Can't get this fixed.

PAO Jack Schmitt attaching traverse equipment to Gene Cernan's backpack.

CERNAN Tallest man on the Moon right now.

SCHMITT Okay, that's done. Okay?

CERNAN Just a second. Close the cover. Not a very good cover. Okay?

CERNAN Okay, Bob, I'm going to put SCB 4 on Jack.

CAPCOM Go ahead. Say again there, Gene. SCB 6?

SCB 4, copy.

CERNAN SC -- SCB 4 will go on Jack. Okay, Jack, I got to get these PLSS straps, too. Would you get mine?

SCHMITT Those harness release straps?

CERNAN Oh, no. Let's do that, Jack. Saw them as you go out, then I forgot about them.

SCHMITT Yeah.

CERNAN Okay, yours is on over here. Probably a better time to do them anyway, rather than when we go out.

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CERNAN Okay, let me get the bag. I'll get the other one when I configure your other side. Okay, you're on. Okay, want to get my PLSS straps? Then, I'll be cleaned up and, then I finish your other side.

SCHMITT Going to get down now?

CERNAN Warmer out here today.

SCHMITT (garble) on the hands.

CERNAN Okay. Okay. Stay where you are, so I can get this -

PAO EVA time, 36 minutes.

SCHMITT Okay, now, come over here, and I'll get you a core cap dispenser, which I left here. Okay, you got SCB 4, you got the cap, you got the rammer, I'll take the hammer. You got the -- that's all you need. TGE is on the LRV. CERNAN Okay, what transfor -- what charge you got there, Jack?

SCHMITT 5 is under my seat.

CERNAN 5. Okay. You got 5 there, we got 2 and 3 on the Rover, LCRU blankets are open 100 per cent, battery covers are closed. I want to -- Push that battery cover over there down just to make sure it goes down.

SCHMITT The warning flag is up (garble).

CERNAN Yeah, it's probably that -- Already, huh? Yeah.

SCHMITT Rover on down there. Rover warning was up.

CERNAN Get that one right there.

SCHMITT It's down.

CERNAN I'll take a look at that gauge again, but the gauge on the high battery looked like it may have failed. Okay, LCRU blankets are open, battery covers are closed, and pushed closed on the LCRU.

SCHMITT I'm going to the SEP.

CAPCOM Okay, Jack.

CERNAN Wait a minute before you do. You got a second?

CERNAN Just come over here by the left front wheel. I know you got a second. Just a little bit closer to the left front wheel, towards me. Oh, that's good, anywhere in there. Wait a minute.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/13/72 GET 164:12 CST 17:05 MC655/1

CERNAN Can you do that likewise? Or can you hold it with that other camera?

SCHMITT It's already set at thirty.

CERNAN Okay.

SCHMITT And you might want to take a couple

CAPCOM 17, we think somebody lost their COM. Jack probably Gene going to Zero.

SCHMITT You read us Bob?

CAPCOM Roger. Read you now.

SCHMITT Bob, you read Gene.

CAPCOM Reading you Jack. I haven't heard Gene yet.

SCHMITT Bob, Gene's calling you.

CAPCOM You read me.

CERNAN How do you read me, Bob?

CAPCOM Okay, read you now.

CERNAN Okay, I didn't do anything. I just jiggled my mode switch here. Okay, we got 2 and 3 on the EP's plus 100 mag feet. The crew blankets are opened 100 per cent, battery covers are closed, dust brush. I've TGE, I've got mag depolarization filter is taken care of, and I'm ready to traverse to the SIM.

CAPCOM Roger. We understand GD stowed and you're taken care of in the COM. And you might give us a Rover readout either now or when you get to the SIM.

CERNAN Okay, we'll see which is convenient.

CAPCOM Yes. SIM is probably more convenient, while you're sitting there waiting for the NAV's to warm up or initialize. Waiting for us to give you the reading.

CERNAN Okay, checking your TV. Mode switch is 1.

SCHMITT Hey, Bob, are you watching LMP?

CAPCOM Not anymore. I switched to TV.

CERNAN Bob, you still read?

CAPCOM Roger. Read you loud and clear. We're now watching the LMP.

CERNAN Okay, I just wondered. Because I just took the TV. I just want to make sure we got COM here.

CAPCOM Yes. We're reading you in Mode 1.

CERNAN And, for your information we both got our cover gloves off.

CAPCOM Copy that.

CERNAN Okay, that's in, that's in, that's in. Should have dusted my checklist on the Rover. I can't read down there.

SCHMITT Bob, the old date fix on the SEP's still working.

CAPCOM Beautiful.

SCHMITT There's a little, both mirrors have a little angular displacement, but not more than 5 degrees.

CAPCOM Sounds like that's the least of the SEP's

CAPCOM problem. But we have hope.
CERNAN Okay, you're going to be over there, huh?
SCHMITT I'm over here. I don't believe this.
CERNAN What's the problem?
SCHMITT Oh, nothing. That roll indicator isn't worth
a ding dong, sure didn't roll 10 degrees.
CERNAN Okay, roll 0, pitch is 0, (garble) is 291,
distance 001, range 000, amps hours are 90 and 85, volts are
6565, sun shadow device, by the way is 0.
CAPCOM Copy that.
CERNAN Batteries are 100 and off scale low, and motor
are all off scale low.
CAPCOM Okay, and Gene, we'd like to torque to 287.
287.
CERNAN Okay in work. Let's see 287. That's a head-
ing from Earth city to (garble). Okay, 2728, 287 right on the money.
CAPCOM Copy that Geno. And ...
CERNAN (garble)
SCHMITT 45 Yankee is sample from near the SEP.
CERNAN Boy, I tell you Jack. That was all cut out.
SCHMITT Oh, well. I got the sample anyway.
CAPCOM We copied 45 Yankee near the SEP. That's all
we have. You give us a frame count when you get done, and give us
an approximate location to the Rover, at least crosswise from the
Y, we'd appreciate it. And we also need SEP receiver power and
DSEA both on. And we'd like to cover tape deck (garble) when
you get done, Jack.
CERNAN Okay, Jack keep me honest on those rille.
SCHMITT Okay, you're okay now. Let me get over on the
rille. I don't see
CERNAN See me?
SCHMITT Go on. You're good.
CERNAN Oh, there's the SEP. Did I miss this other
rille?
SCHMITT Yes. There's the, I'm on the antenna.
CERNAN What about the one coming west.
SCHMITT That's where, no you're okay on the one west.
SCHMITT You're way away from it.
CERNAN Okay. look back.
SCHMITT You want to, head toward the SEP. You're okay.
CERNAN Oh, I see it now. Okay.
SCHMITT Head towards it and then make your turn.
CERNAN I see it. I'll go over to it.
SCHMITT As a matter of fact, turn on these tracks.
CERNAN Yes. I'm in good shape. I see it. I see it.
SCHMITT Bob, that 45 Yankee was a fine grain basalt,
I think. One of the few around here. That's why I picked it up.
CAPCOM Copy that.

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CERNAN I'm stopped and I'm ready to go. I'm 2 meters to the west of the north line.

CAPCOM Copy that.

CERNAN And I guess I'm certainly within 5 meters of the transmitter.

CAPCOM Okay, we'll get that in the photos.

CAPCOM And Gene, how's the low gain located, oriented.

CERNAN It's oriented 355 and my heading is 352.

CAPCOM Okay, copy that.

CERNAN Okay, you want the receiver on.

CAPCOM Roger both ...

CERNAN (garble) out of here, huh?

CAPCOM Roger both the receiver and the recorder on.

Both switches on and then tape the cover down.

Okay, good luck.

SCHMITT I don't know if that tape is going to hold.

Okay ON and ON. Okay, it's taped down more or less.

CAPCOM Thank you.

SCHMITT And then I guess I'm supposed to get on, huh?

CAPCOM Roger on that.

CERNAN Hey, Bob, the NAV reset has been, nav reset is now off and I'm all zeroed up.

CAPCOM Okay. Copy that. And we're ready for you guys to roll.

CERNAN Okay, what's the first range and bearing to the Rover sample. Past Jones.

CAPCOM Okay, it will be 185 and 1.5 on the range.

CERNAN Okay, 185 and 1.5. 185 and 1 and a half. Okay.

SCHMITT Okay, then, Gene, no problem.

END OF TAPE

APOLLO 17 MISSION COMMENTARY, 12/13/72, 17:14CST, 164:20GET, 656/1

SCHMITT Well shoot. I've forgotten how.
CERNAN Well, that Challenger looks pretty from here,
you know it.
SCHMITT Okay, I'm on.
CERNAN Did I want a chart?
SCHMITT No.
CERNAN No.
CAPCOM No charts Jack, no charts.
SCHMITT Okay.
CERNAN Got it.
SCHMITT Got it.185 and 1.5 and I'm going to head on
at about 012. We ought to go right through Jones.
CAPCOM Okay, and Gene, remember the drive it fairly
slow - or fairly well controlled the first 300 meters and a mark at
the end of the antenna.
CERNAN Watch that Jack, watch that antenna lean -
SCHMITT Uh oh. Keep going. Pull it right to you.
It's okay so far. Keep going. Okay, let's do that again but a
little different. I'll pick up that same spot, I can see right
where it was.
CAPCOM Okay, give us another mark when you start
up on that side.
CERNAN Okay, we'll give you a hack, Bob.
SCHMITT Okay.
SCHMITT A little.
CERNAN Hey, I'm right on the track. Same track
exactly.
SCHMITT Well, okay. That's exactly - I just came
right over.
CERNAN Okay, we're starting Bob, mark it.
CAPCOM Copy that.
PAO The crew is on the way to station 6 at the
base of the North Massif. Station 7 is nearby to the east of
station 6.
CERNAN Went too far in this direction. We've got a
big hole up here.
CAPCOM Okay.
CERNAN Like a big one.
CERNAN I wonder if that's Rudolph?
PAO Station 6 is at the foot of what's believed
to be a long boulder trail up the North Massif.
CERNAN Off with B?
CAPCOM No, if you're where you think you are you're
beyond - you're east of Rudolph quite a ways.
CERNAN Hey, I think you ought to know where we are
by now, Bob.
CAPCOM Roger that.
CERNAN Say that's Lewis and Clarke.

APOLLO 17 MISSION COMMENTARY, 12/13/72, 17:14CST, 164:20GET, 656/2

CAPCOM After you give me a mark there we'll give you
- I'll talk to you about it.

CERNAN I'm sorry, Bob. I guess you didn't hear it.
I - we're passed the end of the antenna and we're headed south
or northeast.

CAPCOM Okay, I - did you give me a mark when you
started or a mark when you passed the antenna?

CERNAN I gave you a mark when I started and it took
about 20 seconds to get to the end.

CAPCOM Okay, copy that.

CERNAN Is that good enough or do you want me to
go back?

CAPCOM No. No. Press on. And Jack if you look
at your contour map there we think you are located right now
at approximately where the P in SEP is, just below the P in
Poppy, in which case you're probably driving through that little
crater that's just to the northeast there. That's probably the
one you came upon.

CERNAN It's not very little though.

PAO Distance to station 6 is 3.3 kilometers.

SCHMITT See a little bit better.

PAO Estimated driving time 20 minutes.

CERNAN The major boulders still look like pyroxene
gabbro. Surface texture has not changed. There is a granule
population now that I look at it more closely, with the shadows.
But I have a feeling that most of those are - they look like
they're just small - very small clods. That should show up in
some of the bulk samples we've taken. It is remarkable to me
the - all the small number of fine grain rocks. There's
one at about halfway between the SEP and the LM that I'd like
to pick up, it's a fairly good sized one. Maybe we can get it when
we get back. It looks like a fine grained basalt. I may have
sampled one in 45 Yankee there.

SCHMITT I tell you it's not exactly the greatest place to
navigate through.

CERNAN I think you ought to bear left, don't you.

SCHMITT Yeah. That's where I'm going here. I just
want to get cross this mounted boulders.

CERNAN There's still - there's a crater we're just
passing 207.4 about 20 meters in diameter with the pyroxene
gabbro blocks on the rim, few of them. It's not an exceptionally
blocky rim crater but we are in an area where the block popula-
tion is up to about 5 percent in contrast to most of the area
we traversed yesterday. I tell you going is a little bit rough
Population of block Jack, there is an awful
lot of small craters.

SCHMITT Yeah, I was just going to add that the fre-
quency of craters in the ten meters side range is quite a bit

higher than we were used to yesterday.

SCHMITT Oops there's one. Snuck up on you.

CERNAN And they all, although not exceptionally blocky rim, they all have a slightly maybe two or three or five percent more blocks in their walls and on their rim than do the - does the terrain.

CAPCOM Roger, Jack. Copy that.

CERNAN Still no obvious structure within the dark mantly material itself.

SCHMITT Bob, you said 185 1.5?

CAPCOM That's affirm.

SCHMITT What do you want?

CERNAN To the Rover?

SCHMITT Yeah.

CERNAN Crew sample.

SCHMITT Oh, they changed it on us. Okay. Okay - there's - still seeing the little pit bottom craters with the glass in them. I've forgotten the acronym all ready, Bob, I'm sorry. and you asked me for a LMP frame count a while back and I believe it was 5. That was at the SEP.

CAPCOM That was after the SEP photos, right?

SCHMITT That's affirm.

CERNAN Negative that was before the SEP photos.

CAPCOM Copy that.

CERNAN Okay, Bob, looking up at the North Massif we see these scattered strewn field of boulders that generally seen to start from a - more or less from a line of large boulders which might indicate some structure and those lines are roughly horizontal across the face that we're looking at. The boulder tracks are irregular in shape, obviously down hill but you'll see in the pictures that they - that they are curved in places but they all - that I see - tend to be aggregates of little craters where the boulder was obviously tumbling, and bouncing a little bit. They're out in population of fragments now in the immediate area at - is that 188.

SCHMITT 188 0.9.

CERNAN It's generally about 1 percent between craters. But at the crater rim it's up to about 5 percent.

CAPCOM Okay, copy that Jack.

CAPCOM How far down the North Massif is the line of boulders?

CERNAN Oh, there are several of them, Bob. What I'm talking about is about 100 meter long lines where the boulder trains initiate and there's one about - looks like about half way - maybe two thirds of the way down in perspective, another one that's probably about half way - they're just sort of scattered around on the Massif.

END OF TAPE

CERNAN I think we're getting close to - well we couldn't be.

SCHMITT I've got to move over here a little.

CERNAN That must be Jones.

SCHMITT Where are you looking.

CERNAN Off to the right.

SCHMITT Yes our heading the (garble) down here is really should put up to west of Jones. So that's about right.

SCHMITT A lot of static in the background today.

CAPCOM Yes, I think we are talking to you guys through the LM right now and how about a speed reading.

CERNAN Okay, we're at 12 clicks and we're full bore.

CAPCOM Copy that.

SCHMITT 187 l.l.

CAPCOM Copy that.

CERNAN Bob, I wish I could give you more on that structure in there, but I think those lines of boulder sources are about all we can see right now. Talked about the lineaments yesterday and their not nearly as obvious today in the higher sun. Looking up Wessex Cleft - even with the sun in the flat area it looks darker than the north massif side, but again the sun angle may be fooling us but I recall it was darker on the photos. The old man wrinkled face on the -

SCHMITT Sculptured Hills.

CERNAN Sculptured Hills, though, is evident as soon as you come out of the Wessex Cleft.

SCHMITT Yes, and it looks like there are boulders up on the side of Sculptured Hills except that they aren't nearly as big as those on the north massif. The areas where the boulder sources look like their made up of boulders no bigger than a meter maybe whereas the north massif boulders are up to several meters. Those boulder sources all seem to be up within a third of the height of the Sculptured Hills just south - just east of the Massif -- of the Wessex Cleft. There is a boulder track that crossed the slope. See that Geno?

CERNAN Yes I sure do now. It looks like it goes rather than perpendicular contours it's probably crossing them in a fairly straight line on an angle of 60 degrees maybe.

Back to the east.

CERNAN Yes, back to the east. That one may be fairly near. Jack see this big boulder with the big track it looks like it's on an elongated rolled up boulder look at that.

SCHMITT Looks like it maybe broken now.

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CERNAN Okay, here we are 1.5 and 185.
CAPCOM Okay, copy that.
CERNAN Okay, is this a rover sample.
SCHMITT A rover sample. Tell me where you want
it.
CERNAN Okay, see that little pit right over
there about 30 feet ahead.
SCHMITT I think so.
CERNAN Okay, I've got two pictures there.
SCHMITT How's that?
CERNAN That's great. Okay, this is soil sample.
SCHMITT Hey, Geno.
CERNAN And I just took a locator and CDR is on
frame 41. Got it.
SCHMITT Ah, not yet.
CAPCOM Copy that.
SCHMITT Got it now. Bag 46 yankee.
CAPCOM Copy that.
CERNAN Your bag open?
SCHMITT Yes.
SCHMITT Okay, it's in. We ought to tape that
bead down if we can remember it next stop. It's in the way
of - it's sticking up. Okay, I'll get it that thing came
down - came off that piece of Velcro. I'll get it when I
get back. And LMP frame count is 35.
SCHMITT Okay, Bob I'd like a bearing and range.
CAPCOM Okay, bearing and range for the large
block just beyond let's see it's just beyond the crater
Henry that large block there near the blaker slope which is
our next aiming point. The bearing and range there is 188
and 2.8.
SCHMITT 188 and 2.8, roger.
CAPCOM Okay, and Jack do you - what do you see
in the way of boulders coming down the base of the Sculptured
Hills in terms of sampling opportunities of station 8 and in
terms of boulder tracks that we might lead down to boulders
that might just possibly be accessible of station 8.
SCHMITT Watch this, Gene. Boulder tracks are
not obvious on Sculptured Hills at all. It looks like their
are fragments over there that would have their sources higher
up the slope. I think we can get boulders there.
CAPCOM Okay, copy that.
SCHMITT We'll have to get a little closer, Bob.
CAPCOM We'll find out in a couple of hours.
SCHMITT Yes, I will give you a reading on that
before long. I wouldn't eliminate station 8 for the world
or the Moon whatever's available today.

CERNAN Bob, what did you say 188 2. something.
CAPCOM 2.8.
CERNAN Okay, thank you. See that big boulder
Jack with those tracks?
SCHMITT Yes, it looks like -
CERNAN That's a funny looking boulder.
SCHMITT Looks like it may have stopped rolling
because it broke up.
CERNAN Looks broken to me now.
CERNAN Boy, they've got the low gain right on,
but I tell you we still got static.
SCHMITT I don't have any, Gene. You may -
CERNAN Well, I sure do.
SCHMITT Okay, you've got yourself in some holes
here. I read you all along though so there is no problem.
Okay, there's a big crater. I haven't recognized Jones yet.
Looks like your getting up on the rim of Henry here.
CERNAN Yes, no Henry should be - I'm well - should
be well west of Henry I think. I wouldn't be surprised if
Henry isn't right over that little rise on the right. Bob,
the surface structure hasn't changed texture we're on a little
bit of a rise in here now and still about one percent of
the surface.
CERNAN There's Henry right there Jack.
SCHMITT There's Henry.
CAPCOM Okay, how about a range and bearing.
CERNAN I thought you were close to Henry.
SCHMITT Yes, 188 1.8.
CERNAN And we're just southwest of Henry.
CAPCOM Okay, copy that.
SCHMITT On the rim. Oh, Prince Henry the navigator.
Watch that foot.
CERNAN It's called a wheel I think.
SCHMITT And Henry looks much like Horatio did.
Has boulders on it's inner wall. Not as many, they looked
light colored a light albedo or gabbroic appearance. There
maybe some right down there though that are fine grain they
look a little grayer.
CERNAN Jack, theres our target either one of -
that's one right down there. See the one we've got over there
has a boulder track. That's the one that cross slope and
if we could get -
SCHMITT We'll see.
CERNAN That's station 6. And that was the
turning boulder.
SCHMITT Yes that's it.
CERNAN The one right there. Station 6 - we
can probably get up there -

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SCHMITT I think we can it doesn't look too bad.
CERNAN The (garble) slope right now doesn't
show anything obvious except that where the boulders start.
CAPCOM Okay, we hope that's fairly obvious.
CERNAN And on up the hill you have -

END OF TAPE

SCHMITT As I was saying. Henry just looks like somewhat more mantled Horatio. (Laughs)

CAPCOM Getting to be ridiculous.

CERNAN Say, Bob, I'm navigating headed northwest now to get around the western rim of Henry.

CAPCOM Okay.

SCHMITT And on the west rim we got about 10 percent boulder cover.

CAPCOM Okay, and a reminder Jack to keep taking your Rover photos.

SCHMITT Yes, sirrrrr. And when I - by boulder I generally mean fragments, Bob, in this case. When I say 10 percent, I'm looking at stuff greater than about a centimeter in diameter.

SCHMITT I'll try to say fragments from now on and be more precise. Okay, here's a little area where there's -

CERNAN This part of Henry - this is the one part of the rim of Henry I see, that has fairly large fragments or boulders on 'em up to 2 or 3 meters. But again they all appear to be buried. There are very few except small ones sitting out on the surface.

SCHMITT And you know the fragment population out here only goes out to maybe 200 meters, I expect.

CAPCOM Okay.

SCHMITT Now this concentration of boulders is because of a 50 meter crater in the rim of Henry.

CAPCOM Say that sounds like a lot ---

SCHMITT I think that was one that we -

CERNAN Take a picture in here, Jack.

SCHMITT No. As far as I can see -

CERNAN I'm getting the picture.

SCHMITT Okay, that's - Locke is right ahead of us.

SCHMITT This is one on the - about 50 meters right on the rim crest of Henry. Almost due - west rim, due west rim. Now Locke is just ahead of us. It also has boulders in it's walls. But has relatively few on the rim.

CAPCOM Okay.

SCHMITT Characteristics of both Henry, Locke and Horatio is a - simply no change to the average frequency boulders on the rim. The increase comes in the wall.

CERNAN We're at 1842.3. We're at just about between Henry and Locke.

SCHMITT Locke

CERNAN Locke, yeah.

CAPCOM Okay. I copy that. And you guys are heading for that big boulder which must be just dead ahead of you there about half a kilometer.

SCHMITT Well, we - Gene's sort of headed for Station 6 now.

CERNAN I'm going to take a tour around that boulder and get a case on it.

SCHMITT Go ahead.

CAPCOM Yeah, that would be a good mark to give us a range and bearing on. That's a pretty good straight point.

CERNAN Yeah, we are.

SCHMITT Bob, the boulder concentrations in the wall of Henry have their up slope start at about, oh, I would guess average of 30 meters down from the rim crest. The rim crest of Henry is not very well defined, but it's there. And they - from that initiation of boulders they stream down the slope to the breaketts and slope down at the floor. Still no obvious change in the dark mantle as we're just to the east of Locke now. There's some - there's a 30 meter crater, fairly subdued but still quite deep. (garbled) Again it looks as if it were mantled. That - has no significant increase in blocks on it's rim. That crater in any other place would have been a very blocky rim crater - it's maybe 30 meters by 5 meters deep. Man that is a big rock up there. Turning Point Rock is a split rock, has a - looks like a northwest southeast overhang with another block just this side of it. Just to the south of that overhang. It's pyramid shape in cross section, triangular shape in cross-section. And it looks like it is pretty well fractured although not pervasively like the rock in Shorty was.

CERNAN Okay, Jack, I know I can get up to that Station 6.

SCHMITT Yeah.

CERNAN I'd drive up there.

SCHMITT Yeah.

SCHMITT Now, Bob, Station 6 rod, one of them, is from that boulder track that runs completely across the contour.

CAPCOM Okay, I copy that. Sounds like good news.

SCHMITT And there's - the pictures ought to pin down its - at least the end of the boulder track pretty well.

CERNAN Boy, this is a big rock.

SCHMITT Whewwwwww.

SCHMITT As I recall - as I saw it the boulder tracks stopped about half way up the slope of the North Massif.

CERNAN That is a big rock.

CERNAN We're at Turning Point Rock. And it looks like it's - I don't know if it's mantle on top, but it's

certainly filleted. there's a lot of the dark mantle up and on the shallower slopes of the boulder, and it's on a little mound itself as if much of it might be covered up.

SCHMITT Yeah. Okay, it looks like a breccia from here.

CERNAN Can you get a sample of it right here?
See these chips?

SCHMITT Yeah, I probably can.

CERNAN Okay, Bob, I'm 3 meters from Turning Point Rock on the east side and I'm reading 186 and 2.8.

CAPCOM Roger, copy that.

SCHMITT (garbled)

SCHMITT Okay, are you going to - can you drive up to the - right there lets see - no I'll get 'em. The thing is I don't know what it is.

CERNAN Well, but at least it's part of these fragments around here.

SCHMITT I guess Turning Point Rock is 1, 2, 3, 4, 5, 6, - 6 meters high anyway. It's a - I'd say it's a very rough sub-rounded rock - by the

CERNAN Let me get this, Jack. Okay.

SCHMITT There's two fragments in that sample.
47 Yankee.

CERNAN But from dirt.

SCHMITT And it's about 4 meters from the -
Turning Point Rock on the north side.

CAPCOM Okay, copy that. Get some good photos of the rock.

SCHMITT Yeah, I got a couple. I hope they're good.

CERNAN I'll tell you what I'm going to do here real quick. And my locator is - I'm going to do a 5 6.

CAPCOM Copy, that.

CERNAN Jack, let me spin around this little crater here to the left.

SCHMITT Bob, it looks - it's a very coarsely vesicular, but at first glance, it did not look, like the pyroxene gabbro. Although the rock, that rock does. I - it looks like it might be fragmental although I'm suspicious I'm looking at (garble). That'd be a - oh, yeah - getting over - I got 'em. Pick one out. That's a nice view.

CERNAN And we're on a little rise looking at this boulder.

SCHMITT That's incredible.

CERNAN Okay, we're on the road, Bob.

CAPCOM Copy that.

SCHMITT You know, that, Bob, my guess here right now is that Turning Point Rock is a big piece of subfloor gabbero.

CAPCOM Okay, I gather you changed your opinion.

SCHMITT What looked like fragments is just, what looked like fragments with just big spalls of where the (garble) have cleaned off the rock.

CAPCOM Okay, I copy that. You might be happy to know that we think we've finally found the LM because we were calling that for 188 and 2.8 and you got there at 186 and 2.8.

CERNAN That's not bad.

CERNAN Okay, Jack, it's a split one up there, Jack. I've had my eye on it. For a picture - (garbled)

CERNAN There's some big boulders down here.

SCHMITT Got it. I sort of lost tract of Station 6.

CERNAN Naw, I got it. I've had my eye on that boulder.

SCHMITT You can't see the tracks from here.

CERNAN I bet you can. I can see it now. We'll be looking right up it. Looking right up the old boulder track. Man, I tell you. This navigating through here is not -

SCHMITT Okay, we're in a - region where really the general fiber population is no different. We're up on the (garbled), but you wouldn't notice it, but we are quite a ways.

CERNAN And, the, but the fragment population is not much different than on the plains. The big difference is that theres these scattered blocks that are from one meter to probably ten meters, naw 5 meters in diameter. Hard to say, maybe 8. See that track coming down? We'll be looking right up that track.

SCHMITT Yeah, you got it. I didn't realize you were that far up slope.

CERNAN Yeah, we're way up slope.

SCHMITT Yeah. Hit it.

CERNAN Not very uncomfortable for me on this' side. (laughs) How do you feel?

SCHMITT Oha, I feel fine. Till I looked down here and saw the slope we're on.

CERNAN Yeah, I know it.

SCHMITT And I can't see any obvious change in albedo like we could see with the light mantle yesterday.

CERNAN You -

SCHMITT You got a - don't there you got it. Nice place. Oh, oh, you don't want to go over that way.

CERNAN I can make it.

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CERNAN I wanta park right -
CAPCOM You want to park at a heading of
107.

CERNAN We're going to open the battery covers
and let them cool at the statio to a heading of 107.

SCHMITT 107 huh?

CERNAN Okay, I'll get it up to - hey that's going
to be moderately level right there.

SCHMITT Yeah. Trouble is we're looking into the
shady side of a block.

CERNAN Or if I park on the other side we won't
be able to make a go right up slope.

SCHMITT That's alright. We can work in there.

CERNAN Naw, that's alright.

SCHMITT Hey, I can't go up there. Let me get -
this is going to have to be good - I can't go up there.

END OF TAPE

CERNAN Hey, I can't go up there. Let me just, this is going to have to be good. I can't go up there.

SCHMITT Yes, I think you're alright. That's not very level, but not too, not too hard. Watch that turn.

CERNAN That's not very level, but we're not going to get much more level than that.

SCHMITT Oh, that's good.

CERNAN Let me, they wanted 107. There's nothing I can do. That's not very level for the gravimeter, but let me see if I can get COM. Hey, Bob how do you read?

CAPCOM Loud and clear 17. How do you read?

CERNAN Okay, we're parked on a heading of 106. Are you happy with that?

SCHMITT You parked on a slope, too.

CERNAN No level. There's no level spot to park, here though.

SCHMITT You want some help getting off?

CERNAN I've got to go uphill.

SCHMITT I just about ended up down at the bottom of the hill.

CERNAN Okay, 192 3.8, 3.1 88 and 80 108 and 0 on the batteries. The forward motors are 220 and about 270 and rears are 0 off scale low and 220.

SCHMITT You want me to block the wheels? You got the brake on I hope.

CERNAN You bet you. I don't know if I can lean uphill or not. I can't. Holy Smoly. Boy are we at a slope.

SCHMITT You okay

CERNAN Yes. Let me get this thing set again.

SCHMITT I don't think you can ...

CERNAN Boy are we on a slope.

SCHMITT Okay, I'm going to stay out from between the rocks. It's a beautiful east-west split rock. It's even got a north overhang at, we can work with. And let me see what it is. We're right at Station 6. You wouldn't believe it.

CERNAN I would. Oh man what a slope.

SCHMITT And this boulder's got it's own little track right up the hill cross contoured. It's a chain of craters track and it looks like it stops where it started. It starts in, what looks to be, a lighter colored linear zone, trying to give you perspective, it's probably only about a

PAO TV coming in.

SCHMITT massif. Bob, are you reading us?

CAPCOM Read you loud and clear.

SCHMITT Bob, are you reading us?

CAPCOM Read you loud and clear and we got a picture.

CERNAN Oh man, I tell you, are we parked on a slope. I don't know whether your TV's going to hack it.

CAPCOM Okay, it'll pick up to 15 degrees.
CERNAN Bob, this is a, well you can have it.
SCHMITT It's a coarsely vesicular crystalline rock.
Finely crystalline. Looks like a, probably an anorthositic gabbro. Trying to see the zap fits, for glass color. I don't have a good one yet.
CERNAN Hey, Bob, you want both the recorder and the other switch on?
CAPCOM Roger. Both of those off and the ...
CERNAN Oh man, is it hard to get around here.
SCHMITT Bob, it looks like the glass is fairly light colored. It's not white. Oh no, it's black. It's an anorthositic gabbro, rather than (garble) orthosite, I think. Yes. It's black glass in the pits.
CAPCOM Okay, and Gene, did you happen to notice the (garble) on the stuff when you dusted them?
CERNAN I didn't dust it yet.
CAPCOM Copy that.
CERNAN Bob, some of the vesicles are, they're flattened. All of them are flattened. There's a strong foliation of vesicles in the rock. Most of them are flattened and they are up to 15 or 20 centimeters in diameter and about 5 to 6 centimeters thick or wide.
CAPCOM Outstanding.
CERNAN And there's some beautiful north overhang all around the block. On the north side of the block.
CAPCOM Okay, that's the best place of north overhang and I guess that means one of you guys might grab the SEC, the small can before you leave the Rover.
CERNAN Okay, Bob, it's going to take me awhile to dust. I tell you
SCHMITT Okay
CERNAN Hard to get around here.
SCHMITT Bob, let's get it straight, let's get it straight, you want the north overhang sample in the SEC or the short can?
CAPCOM Miracle of miracles. They don't want the short can. I'm not sure I understand that, Jack, but they don't want the short can here, they say. I guess they're looking for volcanic today. They're looking for volcanic, Jack.
SCHMITT Oh, they are, huh? We found those yesterday.
CAPCOM Well, they're hoping again at station 9.
SCHMITT This is, now that foliation I mentioned does not go all the way through the rock. There are variations in texture. One zone was strongly folliated. There's another, it almost looks like a large, it is, a large inclusion of non-vesicular rock within the vesicular rock. There maybe some auto brecciation involved in the formation of this thing. It really looks mineralogically

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SCHMITT like the light colored samples from the South Massif. But I, I tell you, that's only because it's light colored and I, I can't give you anymore than that right now, until we get a fresh surface.

CERNAN Our next 10 degrees on the SEP and want the tapes, the cover closed, right?

CAPCOM Cover open, please. Cover open. Both off.

CERNAN Okay. Cover's open.

CAPCOM Okay, and did you get the batteries, the LRV battery covers open. We didn't copy that, Gene.

CERNAN No, I didn't copy that you wanted them open. I just got 107. I was about to ask you that.

CAPCOM Okay, we'd like them open. And Jack, while I'm interrupting everyone here, how about a frame count, if convenient.

PAO That's Jack Schmitt at the rock.

SCHMITT Oh, shoot Bob, I gave you one at the rock.
It's now 68.

CAPCOM Okay. Copy that.

SCHMITT Man, I never. You can't believe how tough it is getting around this river on this slope.

CERNAN I think I'll

SCHMITT I think we're probably pitch 20 and roll 20.

CERNAN I think I'll get over and get a pan, while, we're raking sample. Oh, I got to dust those raditors. I can't leave them like that. I tell you, this is not a very good place to dust them, though. Let me try one time. Oh boy.

SCHMITT Be careful, Geno. Need some help?

CERNAN No. I need a little finessee, though. It's one thing to reach over here and do this on level ground. I don't know if I can do that, without falling on the battery.

SCHMITT Well, I found a place to stand, where I can take a pan.

CERNAN Bob, I'm going to have to give you a good battery brushing at the next site. I can't get, I can get half of them, but I can't get the other half. It's too slopy.

PAO EVA time 1 hour 27 minutes.

CERNAN But the covers are open.

END OF TAPE

CERNAN What are you working on, Jack?
SCHMITT I'm taking a pad.
CERNAN Very good. I'm coming right now. Bet
you a dollar to doughnuts that you don't get a TGE reading.
CAPCOM Yeah, Gene. If it's easy enough to take
it off, why don't you take it off the Rover, and we'll try
and level it in the sun.
CERNAN Aw, come on, I'm not sure there's any place
to put it on the ground level.
SCHMITT No, you have to dig a place.
CERNAN Yeah, I'll do it. Okay, it's coming off.
Well, I'll set it right up here.
SCHMITT It's going to fall down the hill.
You'd better stomp off a good place.
PAO Jack Schmitt shooting panoramic photog-
raphy.
CERNAN That looks level to me. Can you see it
from there?
SCHMITT Well, I can see it.
CERNAN I mean, is it -- I don't know. I have
no perspective anymore.
SCHMITT I don't either.
CERNAN Mark, gravity.
CAPCOM Copy the mark --
CERNAN (Garble).
SCHMITT Okay, now, let me get to work. Okay.
See how - how my fender got a little kinked here. Which isn't
going to help us.
CAPCOM Hey, Jack, can we see your gold visor
up? You may want to put it down out here in the sun.
SCHMITT Well, I think I might -- I can't see
with it down. It's scratched. Bob, I'll use it.
CERNAN I think I can monitor that one. Hey,
I'm down here on a boulder track. How does that make you
feel?
SCHMITT That makes me feel like I'm coming over
to do some sampling. Think how it would have been if you were
standing there before that boulder came by.
CERNAN I'd rather not think about it.
CERNAN Okay. Let's go. You got a spot picked while
you're here?
SCHMITT Well, the big thing is let's get those
let's get the boulder and then get -- in that east west split.
Bob, I got an undocumented sample from the middle of the
boulder track.
CAPCOM Copy that. Soil sample?
SCHMITT Whew. Soil sample.

SCHMITT Gene, if you hit them off in there, it's going to be awful hard to find them. That's the problem. Did you pick a spot -- a good spot while you were over here?

CERNAN No, I didn't, I just was looking at them.

SCHMITT I think we need to get in the light,

CERNAN Hey, I can see with my golds on.

SCHMITT Let me put a sample in your bag.

CERNAN Okay, go ahead.

SCHMITT It's bag 534.

CERNAN This boulder looks fairly uniform from top to bottom.

SCHMITT We've got to get a reference sample out of the -- the soil.

CERNAN Let's get it where we get that 90 degree picture, too, so we want to get on the -- really want to get on the Sun side.

SCHMITT Let me get that slab right there, though, to start with.

CERNAN I guess that went off.

SCHMITT Well, there's no -- let's go over on the Sun side because we can't really photograph it.

CERNAN Okay. I gotta get out of here first.

SCHMITT Let's go through the splits.

CERNAN Well, okay. Be careful, though. Why don't we sample the splits first so we don't --

SCHMITT Look at that overhang -- man, I tell you, you get your shovel down there, you'd have a ball.

CERNAN Let's sample in the splits first so that we don't get it too messed up. And, we can sample some of this stuff.

SCHMITT Not -- we want this overhang over here, Geno, the north facing.

CERNAN Right here?

SCHMITT Yeah.

CERNAN I gotta get -- sneak by over there.

SCHMITT Woops. Don't shuffle too much dirt in there.

CERNAN You by me so I can set the Gnomon down?

SCHMITT Not quite. Don't think I can make it. Without hitting you, I can't.

CERNAN Okay. Now try it.

SCHMITT Okay.

CERNAN Ready?

SCHMITT Let me set the gnomon down --

CERNAN Set it down just outside the shadow there. Right. Whoa. Right there. That's good. There's still some good clean ground there.

SCHMITT Okay.
CERNAN Okay.
SCHMITT I get back far enough to take these pictures. I want to go get a stereo pan around the corner anyway. Let's see if I can't start here with about 56. I'm so close. Gee, I'll get a --
CERNAN I must have a boulder.
SCHMITT I'll get it. Let me -- I want to go around the cor -- I got it now.
CERNAN Okay, you got a bag?
SCHMITT All set.
CERNAN Okay, I'm going to get the shadowed material. It's in bag 312, Bob.
CAPCOM Copy 312.
CERNAN And, it's -- it's from -- I think you saw where I got it. It's about a half a meter back of the limit of the overhang. (Garble) Put it down, put it down.
SCHMITT Okay.
CERNAN Can you reach it?
SCHMITT I will in a minute.
CERNAN Keep turned a little bit towards me.
CERNAN Okay, 312. And, the soil outside the overhang will be next.
SCHMITT Okay, go get it.
CERNAN And, the first one is from the upper two centimeters, bag 313.
CAPCOM Copy, 313.
CERNAN And, the second one is from probably down from 2 centimeters down to about 8.
CAPCOM Copy that.
CERNAN Bob, it looks like the fragments just to the, the boulder just to the south of us has some inclusions in it -- light colored inclusions.
SCHMITT Bag 472 on that.
CAPCOM Copy 472 on that. You mean the south half of the split boulder?
CERNAN Yeah. I haven't seen inclusions in the other half. Okay? Okay, now we need boulder stuff. You happy with that, Houston?
SCHMITT Let's get (garble).
CERNAN Got your hammer?
CAPCOM Yeah, we're happy with that (garble).
SCHMITT It's a little hard, huh?
CERNAN I've got to find a corner I can get at.
SCHMITT Yeah. Let me get an after picture down in this hole.
CERNAN All right. Right. You almost stepped on the -- I forgot the after, too.

CERNAN Hey, there are chips up here on top.
SCHMITT Oh, so that's been spalled off.
CERNAN Yeah. We can get some of those. Looks like somebody's been chipping up there. Looks like there's been a geologist here before us.
SCHMITT Let me get the gnomon. I think I can get some of these pieces over here. I want to get that 90-degree angular flight line around this boulder, too.
CERNAN Bob, the more I look at this thing. Here's the piece that fell off. Here's the piece that was knocked off up there.
SCHMITT Yeah.
CERNAN Look at that. We ought to bring a big piece of that home -- that's obvious, it's obvious --
SCHMITT How about this one up here? Take your picture. I think we can just flip that off.
CERNAN See that?
SCHMITT Yeah.
CERNAN I'd better get --
SCHMITT I'll get a locator from here. Okay.
CERNAN I tried to get my downsun, but I'm freezing.
SCHMITT You may be downsun if you do.
CERNAN We'll get some.
SCHMITT Get it?
CERNAN Yeah, will it come off?
SCHMITT Yeah.
CERNAN Yeah. Just throw it in my bag.
SCHMITT It's broken, but it's in place.
CERNAN That's a nice big piece, too. It's about the size of a --
SCHMITT Don't you put it in mine. I can't (garble).
CERNAN Okay.
SCHMITT Got it?
CERNAN Yeah, I got it. No move. Okay, Bob, there's a big spall lying on the ground here that has been knocked off up there from right on top of the boulder. And, I tell you, the more I look at the south half of this boulder, the more heterogeneous in texture it looks. It looks as if it may be either a recrystallized breccia of some kind or you had gabbroic anorthosite magma catch up an awful lot of inclusions. I guess I prefer the latter explanation.

END OF TAPE

SCHMITT Because of the extreme vesicularity of
the rock.

CAPCOM Okay, very interesting.

CERNAN Now some of the - a few of the inclusions
are - well their all subrounded around it and a few of them
are very light colored. I'm going to try -

SCHMITT I'm coming around the corner with a black
and white still.

CERNAN Oh, your going to do it now. Okay.

SCHMITT Well, you know I ought to get one shot back
here with a black and white.

SCHMITT I'll get this half black and white.

CERNAN Okay, if we could get - I think we ought
to pick up a piece of that spall there by the gnomon - I can break
it off. There is one right by the gnomon we can just pick
up. It's a finer grained vesicular rock. (garb;e) I thought I was
going to get this half.

CERNAN Okay, I don't care. I started down
Jack.

SCHMITT Well, they like to have some of them
in black and white you know.

CERNAN I'll get that rock. I forgot to look
at the objective of this station. I hope we're meeting them -

SCHMITT Well, we want to get 500 for that boulder
track. I know I want to get that. Okay, a piece of that
spall rock was sitting by the gnomon - watch out gnomon.

CERNAN How about that?

SCHMITT Is in bag 535.

CERNAN You got one in there already?

SCHMITT Yes.

CAPCOM Okay, we copy that one, Jack.

CERNAN You won't be able to reach - you won't
be able to reach my bag -

SCHMITT No, you can put it in mine. Can you
reach it?

CERNAN Oh, dammit.

SCHMITT Bob one of the light colored in-
clusions looks like it may be an gabbroic anorthisite - let
me get my terms straight. The hose rock has dark enough
(garbled) pit that it's probably anorthasitic gabbro if I didn't
say that. Some of these light colored inclusions have
slightly lighter colored glass and they may be the gabbroic
anorthasite.

CAPCOM Okay, I copy that, Jack.

CERNAN Like this one and that one.

SCHMITT Some of those inclusions get to be bigger
than the size of a baseball. There's one here and a couple
up there.

CERNAN Let me borrow your hammer.

SCHMITT Yeah.

CERNAN Jack, try a little higher. See that one right on the end, right there. Right.

SCHMITT Yep, that's a hard rock - yes that's a hard rock. You might be able to do it I can't. I can't get down there.

CERNAN Okay, we need some of the soil outside the shadow here.

SCHMITT Yes, how about over where your bag went. Let's move around here - I think there is some oops. Get on this slope over here. Okay. How about out over here are we suppose to get - where are we here.

CERNAN I don't know I'd like to get - when you face uphill your camera faces down.

SCHMITT We want go get a rake on the rim of that little crater down there I guess.

CAPCOM Okay, 17 roger you asking about objective of course the primary objective is documented samples of the blocks and then also we'd like to get some of the rake and soil sample out in the surface namely the rim crater there if that's available. And one of the things of course that we are looking for is a variety of rocks here more than just the one boulder. You can sample the boulder for a while, but we would be interested in seeing if there is more than just the single type of rock. Probably also samples from both sides - both of the rock halves. What we said this morning in terms of combining station 6 and 7 to an hour and 20 minutes -

SCHMITT Come on up here, Geneo.

CERNAN Okay,

SCHMITT If you can.

CAPCOM Okay, and so it's sort of your option is to how much time you spend here and how much you go on to station 7 and spend. And if you feel that it's worth while we could spend essentially all that hour and 20 minutes at this station. But, if we did that we'd like to get a fair variety of blocks if they're available.

SCHMITT Okay. Geneo we sampled some of the light colored - as a matter of fact this block looks different -

CERNAN Well, so does that big one -

SCHMITT It's grayer, that's why I've been photographing it. What it is I think - it's a big blue gray rock itself is crystalline I believe. The inclusions are much more sharply defined and it's nonvesicular and it's included or at least it's in contact with the very vesicular anorthositic gabbro right up there. See that?

CERNAN Yes, the whole big one I just -

SCHMITT Did you get some pictures of it?

CERNAN As I bopped around I took pictures of it.

SCHMITT Look, we can get some of that light colored stuff in there along with the blue gray. Try to get as big a piece of that inclusion as we can. See that up in there.

CERNAN Yes.

SCHMITT I think we're out of line of site with them. We're behind the rover.
CERNAN Yes, sorry about that.
CAPCOM We can hear you loud and clear.
We're just looking at rocks right now.
CERNAN Okay, Bob the boulder downslope is more of a light gray vesicular boulder. The one Jack just talked about with some of these larger white inclusions is less vesicular and it's a sort of blue-gray rock. And if I don't fall on my tail here I'll get - the locator is of Henry.
CAPCOM Copy that.
CERNAN Okay, let me try and get up there.
SCHMITT We must be high enough to see some. I haven't looked back.
CERNAN Let me get a close up before you start pounding. No, I might (garbled) from this angle too. That will give them something. Little different up in there too, Jack.
SCHMITT Yes.
CERNAN Why don't you try and sample that. Okay, let's get the -
SCHMITT You want to get my scoop under there.
Probably won't fall out.
CERNAN Okay, get as many of these pieces as we can. I don't know how many are going to come out.
SCHMITT Outstanding - outstanding.
CERNAN The whole thing will come out here in a minute. I'll watch it, I'll watch it.
SCHMITT Is that it?
CERNAN Move your arm up or down.
SCHMITT Okay, I got it in case we don't get another one.
SCHMITT Hey, we're getting good at that.
CERNAN Yes. Can't hold that much longer. Let me get up on this here -
SCHMITT Why don't we get - get a bag out let me put these in a bag.
CERNAN That's why I'm getting up here so I can get -
SCHMITT Oh, okay.
CERNAN just get my balance.
SCHMITT Bob, 5 - 56 is one of the light colored inclusions in the blue gray rock.
CERNAN it's chips.
SCHMITT Chips of it.
CAPCOM Okay, copy that.
CERNAN I think we lost that other one. That's good enough.
SCHMITT I got it I know where it is.
CERNAN That's alright.

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SCHMITT It's not a lot of sample, but it's representative I think. It looks a lot like that sugary rock I sampled yesterday doesn't it. Found in the - we sampled in the - yes, it's pretty easy to break up. It's really not very coherent at all. You know I thought last night, Bob, that I sure used the word abletic for a texture that we saw in that inclusion yesterday on the south massif.

CERNAN If I could keep from falling on my tail.
I want to - -

END OF TAPE

SCHMITT Okay, you going to get some of that?
CERNAN Yes, that's a different kind, that's a more
beat up inclusion of some sort.
SCHMITT Oh, there's a nice piece coming out. Oh, wait a
minute - don't lose it. I've got it.
CERNAN I've got it.
SCHMITT Got it.
CERNAN Okay.
SCHMITT Okay, we have another inclusion and on the surface
has a more reddish brown texture. Interior looks pretty much the same -
its a very light grey.
CERNAN This looks like a piece of breccia.
SCHMITT Looks like a fragment breccia that got caught up
in this thing.
CERNAN Yeah, well, the whole thing is obviously a breccia.
I'd sure like to get that -
SCHMITT Well, let's see. I'm not sure its obviously a
breccia. I think it may - may be a (garbled) rock with breccia inclu-
sions.
CERNAN Well okay, but -
SCHMITT Which is - sort of in the same class.
CERNAN Which sort of makes a breccia.
SCHMITT Yeah, well, out of the big rock.
CERNAN Okay.
SCHMITT But you can - I can't get in there Geno, you'll
have to - no way -
CERNAN Okay. Let me -
SCHMITT Put your (garbled) suppose to.
CERNAN Oops.
SCHMITT I think its easier for you. - Did I give them a
number on that? - No.
CAPCOM Negative.
CERNAN Its - 5 - 536.
SCHMITT Squash it - cramp it a little bit if you can a little
more.
CERNAN Did you get that 536, Bob?
CAPCOM Roger. - 536 for the last one.
CERNAN Oh, good.
CAPCOM And -
SCHMITT Okay, let's go get the host rock here.
CERNAN How about that - how about that - whew - how about
that -
SCHMITT How about this one with the inclusion. Maybe I
can get this one.
CERNAN Okay.
CAPCOM Okay, and - 17 - (garbled)
SCHMITT (garbled) optimistic.
CAPCOM Do you guys have a feeling that the 2 halves of the
big boulder are are different rocks? Or just the same rock split?
SCHMITT No, they're, Ron, they're 2 - they were all 1 boulder
I think. They are just 2 major rock types in the - wherever they came
from and I tried to describe that to you. We have the contact in the
central boulder. There are really 3 big boulders. The central boulder
has the contact between the light grey rock - or the blue-grey rock
and the vesicular morphosific gabbro.

CAPCOM Okay, and you guys have that pretty well photo-
documented, right?
CERNAN Yeah, its in pretty good shape. We're working on
it still.
CAPCOM Okay, copy that.
SCHMITT Try going on the side there, Gene.
CERNAN Its away from the side, Jack.
SCHMITT That's enough. You got a piece of the -
CERNAN I'd like to get the whole chunk.
SCHMITT I think you can get this one up here, can't you?
CERNAN I wanted that one cause it had that inclusion
wrapped in it.
SCHMITT Let me go to high here for a minute.
CERNAN Which one are you talking about? This one here?
SCHMITT Yeah. Its about to come. Oh - oh - oh, okay,
I've got it, I've got it.
CERNAN Ah - okay.(garble) they're both host rocks, we can
put them in the same sack.
SCHMITT No, no let's don't - they're different, please.
537 is a chip of the blue-grey rock and the host - the blue-grey host
rock - and let me get that other one -
CERNAN Oh - be careful -
SCHMITT Pick the rock up while you're there. Its right
at your (garbled)
CERNAN I will.
SCHMITT Okay.
CERNAN My hammer is somewhere.
SCHMITT Okay. And 538 is another sample of that material.
Its a little dustier.
CAPCOM Okay, we copy that.
CERNAN That's the blue-grey, Bob, with the inclusions in it.
SCHMITT Now the blue-grey, the more you looked at it- it
CERNAN Give me your right hand -
SCHMITT Huh?
CERNAN Give me your right hand. Turn it over, turn it
over - turn it over.
SCHMITT Well, I did. How do you want it over?
CERNAN You kept turning it over in the same direction.
Like that, so I can fix that. Okay, now give me your bag and I'll get
it in there.
SCHMITT It - the blue-grey rock - on closer examination
looks like a partially re-crystallized fragment breccia. Its very
hard - and on the

SCHMITT Are you going to get the afters again?
CERNAN Yeah, I'll get them. I want to do a little bit better documentation on that big -
CERNAN Bob -
SCHMITT I'm going to go over and look at that contact.
CERNAN Bob, I got a few close-up stereos of the inclusion that we tried to sample and I'm going to see if I can't give you a little (garbled) -like stereo around this thing - If I can stay on my feet. -
CERNAN Do you read me Jack, Okay?
SCHMITT Yeah, I hear you.
CAPCOM Yeah Houston reads you loud and clear, also.
CERNAN You can see where we've been pounding on this rock. We didn't succeed in getting samples everywhere and I'm giving you a 90 degree corner. Bob, it looks to me like there are inclusion of blue-grey in the gabbro - in the inorthsitic gabbro.
CAPCOM Positively outstanding.
CERNAN Are you saying you think this whole big - you think this whole big blue-grey thing is an inclusion.
SCHMITT Yes sir, and there's some little ones over here.
CERNAN Yeah, but that was in the blue-grey - we've got all these other fragments.
SCHMITT Well that's right - its just several generations of activity and it looks like the gabbro though picked up the fragmental breccia as inclusions - Bob, I would really look that way right now. There's a
CAPCOM Okay, Charlie (garbled)
SCHMITT Its very crystalline. I'll tell you its not a breccia - not like house rock. Not to take anything away from house rock though.
CERNAN Hey, Bob, there's a lot of mantling on a very shallow slope of a fracture here on one of the up-slope rocks. I would assume its just part of a thing its picked up as its rolled down but if its worth sampling you might think about it.
CAPCOM Okay, Gene, if you can get that fairly readily, why don't you - you can perhaps just scoop it up with the bag.
CERNAN That's exactly what I can do.
CAPCOM If you can get up to the rock there.
CERNAN And it will be in my - it will be in my flight line stereo and its going to be bag 557 and I'll take an after to show you where it came from.
CAPCOM Okay, copy that.
CERNAN (garbled) Man, here's a big white clast and there's one on top about a foot and a half across and here's one, must be 2 feet across - 3 feet. And that's in the blue-grey.

END OF TAPE

CERNAN Feel like a kid playing in a sandbox.
SCHMITT Well Bob, I think I've done the best I can.
I'd say that they're pretty clearly inclusions of blue-gray in the
anorthositic gabbro here near the contact.
CAPCOM Okay, and Gene, your bag is hanging by one hook
there. Be careful, if you can.
SCHMITT Okay, I gave you 557, I believe, didn't I?
CAPCOM Roger. We have that one. And whoever is giv-
ing us 557 ...
CERNAN Okay, Ill wait. Jack, fix my bag.
SCHMITT Yes.
CERNAN Okay, Bob, by accident, I didn't think I could
do it, but I got a sample of the inclusion, and it's in bag 539.
Hey, Jack, that's your bag that hanging by one hook. Let me go
get it.
SCHMITT Oh, they're talking to me, huh?
CAPCOM Yes.
CERNAN Yes. I didn't think they could see me. I'm
way up on top. It's blue-gray with light colored,
SCHMITT Put these in my bag.
CERNAN ... inclusions in it.
SCHMITT Alright.
CERNAN But the whole thing seems to be pretty well
older metamorphosed compared to the major rock we just sampled.
To the other blue-gray rock.
SCHMITT This bag is terrible. I can't. It won't
latch. Man there's a dark hole in there. Don't let me. I'm
not,
CERNAN Here's another bag to put in there before you go.
SCHMITT Oh, okay. It won't latch.
CERNAN Yes.
SCHMITT Not at this angle.
CERNAN Put the thumb out one side.
SCHMITT It's dead or something. There, that's pretty
good.
CERNAN Now let me fix your bag.
CAPCOM And 17, ...
CERNAN Okay, Bob, I think that inclusion will give you
an example of what this thing, what the anorthositic gabbro did to
the blue-gray breccia.
CAPCOM Okay, we copy that. And we're ready for you
guys to leave this rock and press on and either get the rake soil
and cores near that crater down below the rock just a shade, or
else go on to some other different variety of rock in the area.
SCHMITT Well, I tell you going down to that crater is
not a problem. Getting back up is.
CAPCOM Okay, well find a decent area to get the rake
soil from and a couple of cores.
SCHMITT Tell you what, Gene, I can go down there and

SCHMITT start a rake and you can come down there.
CERNAN Okay, I, yes I don't think you ought to try
and walk back up, Jack. Let me get a pan from right here where I
got this sample.
SCHMITT Okay, I'm going to go over, I'll go get the
rake and get the ...
CAPCOM 17, it's not that vital to get to that crater.
We just need a good place for a rake soil and a double, and a
single core.
CERNAN Get uphill a little bit, if you can, for the
pan, so that you don't, see my other pan station.
CERNAN Where was it?
SCHMITT It was over there in that crater, just uphill
from the Rover.
CERNAN I'm going up there.
CAPCOM Hey, and 17, we aren't all that gun ho about
that particular crater, if it's that much of a job to get down
to it and back up. Just, we just need a decent place for a rake
soil sample and a single core.
SCHMITT Okay. Bob, we don't move around from here too
much. I tell you, these slopes are something else.
CAPCOM Yes. We agree with that from what we see in
the television. So you can just (garble), and get them where it's
the best place.
CERNAN Well you might take a look at me walking up,
but I don't think I can get to the top. I just got to get a place
I can get a pan from right here. Right in this little hole. Okay,
I left the gnomon down there.
SCHMITT Okay, I'll have to go get it.
CERNAN I think they're set up right here near the
Rover.
SCHMITT I think I'll go and save some water, back on
intermediate.
CERNAN Okay.
CAPCOM Copy that.
CERNAN Hope my lens is clean. Bob, from up
here the Light Mantle is not evident until you see the angular
reflection up on the scarp. Very thin like tangent might be
evident out on the valley, but not nearly as pronounced as I
might have thought from this altitude. Oh, and there's Challenger.
Holy Smoly. You know Jack, when we finish with Station 8, we
will have covered this whole valley from corner to corner.
SCHMITT That was the idea.
CERNAN Yes, but I didn't think we'd ever really
quite get to that far corner.
SCHMITT Bob, that blue-gray rock near the contact
with the anorthositic gabbro does get some vesicles in it. I
think they'll show up in Gene's pictures.

CAPCOM Okay, we have that too, Jack.
CERNAN Okay, I just ran out of film at 160 and I'm
about 2 pictures short of the pan and they're upslope. I think
I can cover most of that with the 500.
CAPCOM Okay, you're going to go to the Rover and
change your mag now?
CERNAN Well, Jack's going to need some help from me.
CAPCOM Okay. Let me know when ...
SCHMITT I'm starting to rake.
CAPCOM Let me know when you get to the Rover to
change the mag, after you get done with that and I'll tell you
what mag to change.
CERNAN Jack, have you got ...
CAPCOM But press on and help Jack with those first.
CERNAN Jack, if you got enough film, I'll just come
and help you.
SCHMITT Okay. Okay?
CERNAN Yes. Remind me to dust my camera, too, will
you?
SCHMITT Don't forget to dust your camera.
CAPCOM Okay, we'll keep track of that for you, Gene.
PAO Gene Cernan took that tumble.
CERNAN Okay, did you get any before pictures?
SCHMITT I'm getting them now.
CERNAN Okay.
SCHMITT It ain't easy McGee.
CERNAN Man, I tell you, these slopes are great. I
wouldn't mind being up on top coming down, but, hey that (garble)
track is quite a trench.
SCHMITT Yes, sir.
CERNAN That thing must be a meter or two deep, huh?
SCHMITT Okay, the big rake. Well, I think I'll try ...
CERNAN Wouldn't it be easier to rake downhill.
SCHMITT It would, but the stuff wouldn't stay in.
SCHMITT Right?
CERNAN Well, I don't know.
SCHMITT It's a thought.
CERNAN Make sure you get that one by ...
SCHMITT I will. We're not really supposed to be
selective about raking.
CERNAN No you're not, you're just covering the area.
SCHMITT That's why I set up there.
CERNAN A selective sample is better than no sample
at all.

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CAPCOM Copy 558.

CERNAN Bob, most of the

SCHMITT Let me go another couple of flights, okay?

CERNAN There's one a couple of inches. Most of them are an inch or so or smaller. They're angular to subrounded fragments. Some of them look like the inclusions. As a matter of fact, the ones that are broken open look like some of the light colored inclusions we saw in the big boulder. The others are too dust covered to see anything about. A couple of them look very coarsely crystalline.

SCHMITT Okay, put these in there.

CERNAN Big deal. Now we ended up with three more. OK.

SCHMITT I get them after, such as it is.

SCHMITT We want the soil here also.

CERNAN Oh, that's right.

CAPCOM That's affirm.

CERNAN Okay, you want to put that in.

SCHMITT Yes I better put it in before.

CERNAN Okay, let's try for the soil

SCHMITT 559 for the soil.

END OF TAPE

SCHMITT (garbled) soil.
CAPCOM Okay, copy that and 17, our present plans from the back room are we'd like to get the single core, the 500 mm shocks and I guess maybe one could do one, and one could do the other; and then we'd like to press on and do a short station 7 unless you think you have got a fair variety of rocks, the feeling is you have a variety of rocks.
SCHMITT Yes.
CERNAN Little more, little more, little more.
CERNAN Okay, Bob, I'll get the core and let Jack get the 500. 559 is a kilogram of soil.
SCHMITT I think we've pretty much covered the general variety we've seen here. I think we've seen most of them in that boulder.
CAPCOM Okay, and so we'd like to go on to Station 7 then when you get the 500 and the core and hopes of finding a variation of boulders along the front.
SCHMITT Okay.
CERNAN Let me know when you get it.
SCHMITT Okay, after - Okay, why don't you get the 500 and the RB's on 120.
CAPCOM Copy 120 there and Gene if you want to change we recommend magazine fox trot or fran as the case may be.
CERNAN Okay, will try foxtrot franny. Okay, don't forget to get that boulder track.
CAPCOM And while you're at it Gene, you might catch the Rover when you're leaning over the seat.
SCHMITT Let me look at your camera.
CERNAN Oh, if this Rover wasn't here we'd roll down hill.
SCHMITT Hey, Bob, I think we could use an upper here if you want to save the lowers.
CERNAN I think so too. Which ever you want.
SCHMITT Do you want your.
CERNAN Naw, I'll get it. Why don't you get your 500 and I'll
SCHMITT Okay, but do you want a core? Watch the fender.
CERNAN The core's in there. Isn't it.
SCHMITT There's some under my feet if you want to use it.
CERNAN I'll use those.
CAPCOM Standby, Jack, we have 3 lowers and 2 uppers so we'd just as soon use the extra lower here in the single core. That'll give us 2 uppers and 2 lowers left.
SCHMITT Okay.
CAPCOM Double.

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SCHMITT Should be a lower in there Geno.
SCHMITT Bob, any special place you want
that out here on the slope.
CAPCOM That's affirm. Just out there on the -
I guess if you saw a crater you might look at that but primarily
we're looking at the crater.
CERNAN I'll get it Jack. Don't worry.
SCHMITT Okay.
SCHMITT We have a couple dents in our wheels.
CERNAN That's better than having a flat tire.
SCHMITT Did he say in a crater.
CERNAN I'm not sure what he said.
SCHMITT Thinking. How do I get this doggone - Been
trying to come off.
SCHMITT You got to unlock it.
CERNAN Yeah, it is unlocked.
SCHMITT Okay, now push down and turn.
CERNAN Okay, I got it.
SCHMITT How am I going to see up there to shoot
this thing?
CERNAN Well, why don't you lean against the
rock? Go over there and lean against it. Well.
SCHMITT I have to do something, I was trying to
get so I could lean against the Rover, but that ain't going
to work.
CERNAN The Rover isn't steady enough for you to
lean against.
SCHMITT It's steady enough. There's just no
place to lean.
CAPCOM Okay, Jack, and if you'll listen for a
minute I'll tell you some possible 500 mm targets the people
have in mind. And one the LM if you can see it from there.
Two, Nansen if you can see it from there. Three, Laura and
four, Shorty. In other words I guess they're talking about
looking along your traverse from yesterday. It could be mostly
the back shot apparently. And then also the South Massif
and I don't know what but you can get a boulder track leading
up the North Massif. Also, they'll be looking down hill
towards the LM Stations 2, 3 and 4. Nansen, Laura and
Shorty.
SCHMITT I got you Bob.
CERNAN Yeah, the LM is visible by the way.
SCHMITT Okay, I got a set of the - the - what
looks like the outcrop from which the boulder came.
SCHMITT Ah, I'm afraid they're moved a little
bit.
CERNAN Ah, I can't - That's it.
SCHMITT I got a few pictures looking up the boulder track
and then off to the left a little bit. And one off to the right
and I think, I'm not sure how well they overlap, that's just
an awful large shot.

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CAPCOM Okay. Good on that. And if you're done with that if you got a frame count, you're still taking them I guess it looks like.

SCHMITT Yeah. Okay, my camera is clean, magazine foxtrot is on about frame 2 and I cycled through and I've got the core all set and I'm going to go get it and I didn't hear where you said to put it, Bob.

CAPCOM Anywhere.

SCHMITT Oh, man, you're easy.

CAPCOM Kinda figured (garble)

SCHMITT Anywhere? Not the bottom of a small crater, huh?

CAPCOM Any place. And did you get your camera dusted.

SCHMITT Yeah. I got it all dusted and got a mag change. It's 448.

CAPCOM Copy that.

SCHMITT Okay, I'll even get you a picture of it.

SCHMITT Oh, me oh my.

PAO EVA time 2 hours and 15 minutes.

SCHMITT Oh me, oh my.

CERNAN Can you get the LM from there?

SCHMITT Yeah. That core one is very easy, Bob. I pushed it in about a quarter way and about another 5 or 6 wacks and it's in all the way.

END OF TAPE

SCHMITT Okay, come on out now, Baby.
CERNAN Okay, Bob. Shorty and Station 3 and
Station 2, and what else?
CAPCOM And, any sort of outcrop you see in the
South Massif.
CERNAN I thought we shot those.
CAPCOM Okay, if you got those, fine.
CERNAN No, I mean the other day.
CAPCOM Well --
CERNAN I'll try again.
CAPCOM Stereo is stereo, is stereo, I guess.
SCHMITT I got your little soil -- Well,
but it's not stereo; it's right along the same line.
CERNAN Lunar -- lunar soil mechanics as a whole,
which stayed intact, very nice and round.
CAPCOM Okay, we copy that.
CERNAN Okay. Oh, man. Houston, we got a
couple of bented tires.
SCHMITT Okay. My hands have had it.
CAPCOM Okay. Good enough.
SCHMITT You aren't going to get anything else
out of me if I keep taking pictures.
CAPCOM And, Gene, what's a dented tire?
CERNAN A dented tire is a little oh, a little
golfball size or smaller indentation in the mesh. How does
that sound to you? Doesn't hurt anything.
CAPCOM Sounds like a dented tire, that's how
it sounds.
SCHMITT Frame 31.
CAPCOM Cappy, copy, Frame 31.
CERNAN That's sort of like what it is.
CERNAN Okay, LMP was what? 120. I guess
we can get to the next station with that
CAPCOM Roger.
SCHMITT Yeah, I got a brand new mag out.
CAPCOM And, we'd like to get you guys rolling
as soon feasible there.
CERNAN Yes sir. It's our policy.
SCHMITT Okay, I'll need your rammer, so if you'll
just turn right.
CERNAN Good timing. Pin's out, core tube is
safe. It's full.
SCHMITT I knew it was.
CERNAN Okay, you take it and put this under
your seat if you want, Jack, and I'll get the TGE. Oh, let
me put your shovel back on for you.

SCHMITT I'll get it.
 CERNAN Get that?
 SCHMITT Yeah.
 CERNAN Don't lose that. Boy, if you do --
 CERNAN Okay, did you give them the number?
 SCHMITT Yeah, they got the number out of the LMPC.
 CAPCOM Roger, we got it. Copy that out of the
 LMPC.
 CERNAN (Laughter) Ha, I'm sneaking up on the
 TGE.
 SCHMITT Need some help?
 CERNAN No, no, it's -- just sneaking up, that's
 all.
 SCHMITT Can't even let you lean on me.
 CERNAN No, I got it.
 CERNAN 670 109801 670109801.
 CAPCOM Okay, we copy that.
 SCHMITT The thing I didn't do, well, you're doing
 now.
 CERNAN Do?
 SCHMITT Didn't get pictures of those collected
 vesicles.
 CERNAN I don't think the ones you had were in
 that kind of rock.. I don't want to lose that thing, so I
 guess --
 CAPCOM Okay, 17, when you get back on, we don't
 need any charges, and we'll leave the sets turned off.
 SCHMITT I'm not sure. Did you turn it off, Gene?
 CERNAN Yeah, I turned it off. I turned it off --
 Okay. Let me see. We want to move on to 7 here. (Garble)
 document core you got your stereos, we got two pans, CG camera.
 Okay, we're going to head east and look for Station 7, block
 Horatio contact change, get a different sample of rocks.
 SCHMITT Okay, I sure want to get one or two of those
 nice ones in the Big Bad While over there.
 CAPCOM Okay, Gene'll bring one.
 CERNAN Open the gate, and I'll bring one.
 CAPCOM Okay, and let me know when you get ready
 to get back on the Rover there, 17.
 SCHMITT Guess we didn't open it again.
 CERNAN Should, though. It's all fitting right.
 CAPCOM You could put them under Jack's seat, if
 it's easier.
 SCHMITT Okay, what do you want done to the SEP
 while I'm here? You want the blanket stayed -- left open?
 CAPCOM Okay, we'd -- Negative. We'd like the
 blankets closed and face down again, if possible, and both
 engines left off. We won't touch it again until Station 8.

CERNAN Oh, tape's not going to stick anymore
I'm afraid.
CAPCOM Well, try --
CERNAN Big bag open?
SCHMITT Yeah, it's all open. All set.
CERNAN Get me a -- I need a normal sample bag
for one here. It's pretty fragile.
SCHMITT Okay.
CERNAN Oh, that doggone thing's not going to --
this tape is full of dust now. Okay, wait a minute, Jack.
SCHMITT Here, let me get this thing. I'm about
ready to drop it.
CERNAN It looks like a gabbro.
SCHMITT There's sample bag 560.
CAPCOM Copy, 560.
SCHMITT And, 560 has an undoc -- undocumented
except by the pans -- very white -- looks like a crushed
anorthosite. It looks like the (garble) inclusions in the
breccia. In the grey breccia -- grey and recrystallized
breccia.
CAPCOM Okay, we copy that.
CERNAN Yeah, you get around, we close this gate,
you might try and hit that -- top of that SEP down again.
SCHMITT I will.
CERNAN Hey, Bob, you're staying keyed an awful
long time. We can hear a lot of what's going on back there.
SCHMITT Grab it. We can stow it away. Okay.
CERNAN Close it. Yeah that got it.
CERNAN Hey, it's stretched.
SCHMITT That's got it. Okay.
CERNAN Woops, woop, woop, why'd that come off?
SCHMITT Well, because it's not locked. It's
(garble) never was locked.
CERNAN (Laughter) We lucked out. Okay, we're
moving. Sort of.
CAPCOM And, before you get on, remember to close
the battery covers if they --
CERNAN Yep.
SCHMITT Your camera lens looks all right, Gene.
CERNAN Yeah, I dusted it already.
SCHMITT Oh.
CERNAN Okay, cover closed --
SCHMITT Do they want it on or off? Leave it off, huh?
CERNAN Leave it off, but try and close that cover
as best you can.
SCHMITT Well, I'm afraid the tape has had it.
CERNAN I know it.
SCHMITT You want us to tape it again, Bob? What
did you do with the tape?

CAPCOM If you can grab the tape right off, but don't spend a lot of time on it.

SCHMITT What did you do with our tape?

CAPCOM Let's worry -- about let's worry about station 7 if we're going to worry about it. Press on.

CERNAN Okay.

SCHMITT Yeah, let's -- let's forget it now. It's too hard to work on there, and it's not going to take just a minute. It's going to take too much time. I'm not sure I can get back on here.

CERNAN Well, let me give you a hand. We need any a -- we don't need any --

SCHMITT Nope, nothing. As a matter of fact --

CERNAN I could drive, Jack.

SCHMITT Why don't you drive down and get -- so you're not (garble) You can get on -- you can go downhill very easy.

CERNAN Yeah. Okay, let me get the TV, the battery covers are closed --

SCHMITT Let me carry --

CERNAN Why don't you just go down there. I'll carry the Rover samples.

SCHMITT Got it?

CERNAN Okay, I'll get that out of your way, too.

SCHMITT Okay, all that down there that - that side hill over to those boulders right over there, and then, if that's any change --

CERNAN Okay. You might, if you get another sample -- a large sample, you might grab it, and we'll throw it in the footpan here and -- and, I'll see if I can't find a level spot to --

SCHMITT I sort of ought to have my scoop, too.

CERNAN -- help you get on. No, don't take too much; just take that. That's all you need.

SCHMITT How about letting me have your hammer?

(Garble)

CAPCOM Okay, and 17, can you verify that the -- that the gnomon is back in the Rover?

END OF TAPE

CAPCOM Okay, and 17, can you verify that there's no
miner sack in the Rover?
CERNAN No miner's on the Rover. The TGE is on the
Rover.
SCHMITT The rake.
CERNAN The rake is on the Rover, the scoop's on the
Rover. We got the, you put the core under your pan, right?
SCHMITT Yes.
CERNAN Okay, I'm going to power up and see if I can't
come down and get you. It's fun walking downhill. Boy, that
boulder track is impressive.
CAPCOM Okay, and 17, when you get moving, we want to
get, and I quote, a maximum variety of hand samples with a minimum
amount of documentation, in a minimum amount of time at Station 7.
It's just an attempt to see what kind of variety we can get along
the face of the front. Over.
CERNAN Roger. Okay.
PAO Station 7 is 8 tenths of a kilometer east of
Station 6, still along the base of the North Massif.
SCHMITT I probably ought to turn my water off of max
if that's where it is. It's cold. I don't want to run out today.
CERNAN Well, the roll indicator says 15 degrees and
the pitch indicator says about 12. I don't know if I believe all
that. Bob, you with us?
CAPCOM Go ahead. Right. We're with you.
CERNAN Okay, I'm rolling.
CAPCOM Copy that.
CERNAN Man, this is still a slope. Jack, I'm going
to pull around in the front of the way you're facing. I can go
down ..
SCHMITT There's a crater over here. Don't drive through
it.
CERNAN Oh, there you are. This is much better. How
is this?
SCHMITT That's great.
CERNAN We ought to be able to pick up lots of those
fragments on that field out there.
SCHMITT Be right with you.
CERNAN Okay.
CERNAN Bob, I just came down slope reading 193 3.1,
just about 100 meters to pick up Jack.
CAPCOM Okay, copy that.
SCHMITT Okay, bag 48 Yankee has a sample of about a
half one-third meter boulder, that was lying in, that's sitting
right smack dab in a little crater of it's own.
CAPCOM Copy that.
CERNAN Oh, Jack.
SCHMITT What.
CERNAN Oh, you just kicked a snow storm of dust across

CERNAN here.
SCHMITT I'm sorry. I just fell too.
CERNAN Did you. You alright?
SCHMITT Yes. Got your hammer?
CERNAN Yes.
SCHMITT I got to drop it in the pan here. Hold
on to it I think. Couldn't help that one.
CERNAN Oh, if we get some more level spots, I can
dust this thing back there.
SCHMITT Am I really on.
CERNAN You're high. You're twisted. Go away from
me one twist.
SCHMITT Okay. Is it caught.
CERNAN Yes it is. Get up, get up. You're sitting
on, get up. Let me put this away. Get up, out all the way.
SCHMITT Oh, that thing.
CERNAN Yes, this thing.
SCHMITT That's right.
CERNAN That's where it's setting high. I knew I'd
forget that. Okay, now. Let me get this thing out.
SCHMITT Okay. Okay let's press. Better get lashed.
CERNAN Okay, all set?
SCHMITT Yes.
CERNAN Okay. We're rolling, Bob.
SCHMITT LMP frame is 130. You got a lot of static
now?
CERNAN Yes.
SCHMITT Hey you got a rock on your right ...
CERNAN I got the low gain set. Hello, Houston, do
you read.
CAPCOM Roger. We read loud and clear.
CERNAN Okay. How about that field, not this block,
but there's sort of a collection of them way out there.
SCHMITT Way out there about 300 meters or so.
CERNAN Oh at least.
SCHMITT Oh, going into the Sun, I can't see a thing
to tell you about Wessex Cleft.
CAPCOM Okay, station 7 is normally 08 and 3.3, but
it's any group of any significant boulders we want to stop at
in reality.
CERNAN Understand.
SCHMITT Oh, easy.
CERNAN You feel like you're on a down slope over
there?
SCHMITT Yes. I feel like you're about ready to spin
out downhill any minute.
CERNAN Do you. I don't feel that all up here.

SCHMITT Bob, it's hard to give you much looking into the Sun the way we are.

CERNAN We must be about 200 meters up the slope, looking at that little valley down there Jack. Am I right.

SCHMITT Yes. I think you're right. The pattern on the slope really doesn't look much different than on the light mantle. Matter of fact, it looks very much like light mantle, except for these large blocks that are in it.

CAPCOM Okay, copy that. And you guys may still have your visors up. We can't tell, but you might be better off with them down, if you've forgotten that they're up.

SCHMITT Well, I can't see. My hands work just as well as my visor, as a matter of fact.

CERNAN I can't believe mine could be up.

SCHMITT You've got a crater right in front of you.

CERNAN Yes. I got it.

SCHMITT Okay, that looks like a pretty good pile to work on.

CERNAN Yes. Let's go over, and wait a minute. Bob, what heading do you want me to park on. I want to get in that flat area, Jack, so I can dust the radiators.

CAPCOM Gene, this is going to be a very short station. Probably not more than 10 or 15 minutes, but just a grab, as I say, a maximum variety of hand samples, with a minimum amount of documentation and a minimum amount of time.

CERNAN Okay, we can do a pan, and pick up a lot of those small ones Jack.

SCHMITT They're trying to chip.

CERNAN I think it's a little more level.

CAPCOM We'd like to have the TV camera and it's mirror and stuff dusted there, however. So we won't do anything about it.

SCHMITT I thought you were going to stop back here.

CERNAN I was going out here around around this big one.

SCHMITT I'm sorry. I misunderstood you. Gene there's a lot of little ones up in here I want to ...

END OF TAPE

CERNAN Yes, there is a lot of little ones up
in here I want to -
SCHMITT Okay, do not do anything to the batteries,
understand.
CAPCOM Roger.
SCHMITT I can't figure out where you're going to
stop.
CERNAN Right in here - right here to give you
as much of a level spot as I can. That's about as level
a spot as I can find. I'm inside a slope of a crater.
SCHMITT Bob, I'm at 200 3.3.
CAPCOM Copy that.
SCHMITT You want me to help you with it - that
thing (garble).
CERNAN No, I'll get it only one guy can do it.
SCHMITT You take a pan before and we'll start
picking up some of those samples and I'll take a pan
afterwards.
CERNAN Let's see here.
SCHMITT What kind of variety we can get here.
CERNAN There is another one of our blue gray
breccias I think over there. Recrystallized breccias with
some of that crushed anorthosite in it. I think right in
here I'm going to take the pan at about.
CAPCOM Jack, what's your frame count?
SCHMITT 131.
CAPCOM Okay, press on.
SCHMITT Bob, I'm going to take the pan at 118
so you can see the fragments that we are going to pick up
here. Then we can take another one at the location work.
CAPCOM Copy that.
PAO The picture's coming in now. EVA time
2 hours 38 minutes.
SCHMITT Should have it, Bob.
CAPCOM We've got TV. And I repeat we'd like to
get some dust both on the mirror - dusting of the mirror and
the lens of the TV. TCU and TV.
SCHMITT Let me get - let me get down on the
(garble).
CERNAN I wouldn't do this for anybody but you
you know that.
CAPCOM Okay, looks good Gene. Thank you.
CERNAN You know what? I'm getting tired of
dusting. My primary tools the dust brush and the hammer,
and my head. Okay, you ready to start picking?
SCHMITT Picking.
CERNAN Okay.

CAPCOM And - -
SCHMITT You notice the temperature difference with the high sun angle.
CAPCOM Roger, you're probably letting in a lot of infrared without having that gold visor down too. That's sort of an infrared shield.
SCHMITT Yes, but mine has been down all the time, Bob.
CAPCOM Copy that.
SCHMITT Except in the shade. Okay 540 is the first bag of selected samples.
CAPCOM Copy that.
SCHMITT Okay, I'm going to leave it open, but don't let me - let me get - here put that one in there.
CERNAN Wait a minute let's get a bag on it. We're getting too many rocks we don't know where they came from.
SCHMITT I don't think it will fit know it.
CERNAN Then we will wrap it a little bit. It looks like it will fit.
SCHMITT Okay, bag 541 is partially around another big rock in Gene's collection bag. Did you get pictures of this thing here.
CERNAN Yes, well not the big rock yet. Not in focus anyway. I got to do that. I was just collecting in this area.
CERNAN Why don't you just keep grabbing a few and I'm going to -
SCHMITT That's what I'm doing.
CERNAN That's one of the blue gray rocks, Bob, and it's got a light colored fragment that runs the full height of it about a metre and a half thick and then it's got the gray or blue gray rock on the other side. As a matter of fact - let me look at it closely. It's a fragment in it alright.
CAPCOM Okay, copy that Gene. And remember to document around the corner at your target the full documentation of the boulder.
CERNAN Bob, I wouldn't be absolutely positive, but it sure looks like I see a dikelet in here that's in the inclusion. And I'm going to get a close up stereo of it. I'd call it a dikelet if you pinned me down.
CAPCOM Okay, copy that.
CERNAN Pin him down. I wish I could break a sample right off. Here's another one - it is a dikelet. There's three or four of them.
CAPCOM Okay, copy that Gene very good.

CERNAN Oh, me oh my. The material in the dike looks - yes it is (garble) it is not covering it. It's between the - it's between the lighter colored rock and the blue gray rock.

SCHMITT 542 is another bag of goodies.

CAPCOM Copy that.

SCHMITT Gene, let me get rid of this.

CERNAN Oh, wait a minute. I got - I got - well maybe it isn't a dikelet - maybe it's just a screen covering a flow covering.

SCHMITT No, you got - their dikes

CERNAN Let me get this whole thing in a bag.

CERNAN I got a rock, Bob, it's fractured primarily around a dike. It's in several pieces, but we're going to put it all in one bag, 543. Some of the men are going to have to assemble that.

CAPCOM Copy 543.

CERNAN Here let me get it piece by piece. Okay, we need to put one of those dikes in another bag.

SCHMITT Bob, it looks like some fraction of the blue gray material has obviously intruded. Can you get that dike there. Get that.

CERNAN I get it right here.

SCHMITT No, get the piece with - you get more of it right there. It's this soft white inclusion again it breaks pretty easy.

CERNAN It's got to be a dike look at that.

SCHMITT It is.

CERNAN Okay. Okay 544.

CAPCOM Copy that.

CERNAN Oh yes, it is because I just broke into it.

CAPCOM And, we'd like to have you guys moving again in five minutes to get to station 8 on time.

CERNANT Yes sir. Looks like - although the blue gray up on the hill looked like a fragment breccia. If this is still related then it's been through partial melting sometime.

CERNAN There is a preserved contact between the dike and the white material.

SCHMITT That's what I wanted. Why don't we get this big piece of dike now.

CERNAN See if you - whoah don't hit it again. There you've still got some - -

END OF TAPE

CERNAN It may be on ray somewhere because it goes right down hill - this little bitty boulder trail pattern goes right up the slope.

SCHMITT I think those are later than the crater by a long ways.

CERNAN Did you sample anything over here?

SCHMITT No, I haven't done anything -

CERNAN I'm going to pick up the piece out of that little -

SCHMITT Yeah, get this -

CERNAN - crater.

SCHMITT Want your gnomon over there?

CERNAN Yeah, I'll just take it to it. Let me know when you're ready for a band.

SCHMITT Well, I'm about ready.

CERNAN You about ready?

SCHMITT Yep.

CERNAN Okay. I raked about a 2 meter square and maybe - yeah, about 2 meters, and down to 4 or 5 centimeters for these. Pretty good population.

SCHMITT They all gonna go in?

CERNAN They're all in. 565 -

SCHMITT Great, great.

CERNAN 565.

CAPCOM Okay, copy that. Sounds great. Sounds like a good rake sample for a change.

CERNAN Yes sir.

CAPCOM And this is a kilogram soil location, fellows.

CERNAN Yes sir. Jack, your bag is full, we're going to have - no it isn't, but we're going to change it when we get back anyway, and that one ought to go under your seat.

SCHMITT Oh, okay.

CERNAN Get your kilogram. I'll be ready to take it. The kilogram is in 566.

CAPCOM Copy that. And, remaining here, we have primarily a trench. If you fellows think its feasible, we'd like to be moving in one one minutes, 11 minutes, and we could use a pan from this lower location also, probably.

CERNAN Why don't you go back and dig a trench at the Rover.

CAPCOM Roger, that sounds good to us.

CERNAN Okay.

CAPCOM And we also remind you of getting a pan of the lower section there.

CERNAN Once we are going to dig a trench at the Rover, we just scoop this out. I'll get the sample here that I got documented now and -

SCHMITT Did you? Is that all going to go in there?

CERNAN Yeah, it'll go. Can you twist it.

SCHMITT Got it. That duricrust rock may have been too much. Take that rock out, and it'll stay.

CERNAN No, it'll stay. We're going to have to put it in mine, though. Well, let me try. Since we're going to unload your bag, it may be the last - the last one.

SCHMITT That's the last one for your bag.

CERNAN Okay. Did you get anything out of that little crater?

SCHMITT No, but I'm going to right now.

CERNAN Okay. Why don't you get your after picture over there and go down and get that trench. I'll come down -

SCHMITT You don't want a bag, okay.

CERNAN I can back it - I can do it -

SCHMITT Boy, almost pure white and very friable. Oh, boy, is it. Pure white. Right out of small little pit crater on the side of this crater I just walked in, Houston. And it's pure white, very friable I got about, well, one big piece and several small in 567.

CAPCOM Copy that.

SCHMITT Bob, the walls of these craters - the big craters around here, that is, the ones that are say, 15 meters in diameter, tend to be a little bit lighter albedo than ones down in the mantle area. I'm afraid those pictures on that rake may be a little bit made to be through a dustcovered lens.

CERNAN Yeah, they were also in my documented sample, here, too. Okay, where do you want this trench? On the side of this crater?

SCHMITT Well -

CERNAN I'll drop my gnomon.

SCHMITT I don't know. I don't - I was just thinking about that. I think - I think we ought to get out in the inner crater area to see if there's any stratigraphy to the - to whatever the talus is.

CERNAN Okay, Jack. I'm going to leave the gnomon right here.

SCHMITT I'll get it.

CERNAN And, while you're digging that trench, we've got to pan again, but I want to fix this fender.

SCHMITT I guess this - the pan's mine, isn't it, this one?

CERNAN Yeah, it is, and I want to fix the fender before -

SCHMITT Okay.

CERNAN - before we leave.

CAPCOM Okay, we agree with that and you might get a - you might get us the gravimeter reading there, Gene, while you are at it.

(garble)

CAPCOM And if you have time, you might drop the gravimeter on the ground and we will get a reading with it on the ground as well.

CERNAN Holy smoly. The gravimeter's coming up. 670096001 - 670096001.

CAPCOM Copy that.
CERNAN You want it dropped on the ground, huh?
CAPCOM Gently.
CERNAN Gently. I can't find a general level spot
but I'll level it. If it takes pictures or does it's thing
on the Rover, it'll do its thing here.
CAPCOM (garble) Yeah, it's just to get a check.
CERNAN Okay, mark.
CAPCOM Copy that.
CERNAN It's fender fixing time, it's camera taking
off time, and I think I'll zap myself with a little cool water.
CAPCOM And how's the trench going, Jack?
SCHMITT Oh, down.
CERNAN Oh, man, I tell you. When you call for
cold water, does it come in nicely. Whew. I'm really happy
with this fender, really happy.
SCHMITT Bob, I have dug - have gotten a wall now in one
place that's standing about 25 centimeters high and it shows
no apparent change in the texture of the soil to that depth
except possibly at the lower 5 centimeters, there's some zones
that might be slightly more granular. Particle size, may be,
up a little bit.
CAPCOM Okay, I copy that. Probably just three
samples and that will be sufficient then.
SCHMITT I think - I think so. Maybe four.
CERNAN Be there in a minute, Jack.
SCHMITT Oh, that's all right. I can probably get
it started.

END OF TAPE

CERNAN Oh, oh, oh boy.
SCHMITT Need some help?
CERNAN Nope. Boy we are sure giving this suspension system a workout. Whew. I can't even see it. - Well, everything getting awful dusty.
SCHMITT Boy, everything is stiff. Everything is just full of dust.
CERNAN There's got to be a point where the dust just overtakes you and everything mechanical quits moving. Like scoops. I'm not sure whether (garble) will like the fender, but it will sure buy the fix. Okay, it's fixed.
CAPCOM Okay. Copy that.
CERNAN It's fixed and I'm happy. I like it.
CAPCOM Roger. We copy that and copy it again. And we'd like to have you guys moving in about 3 minutes.
SCHMITT Good luck.
CERNAN You need me to help you get - bag those samples, huh?
SCHMITT Yes sir. I think I do. I can't adjust my scoop to my belt bagging method.
CERNAN Let me get back on some lighter cooling to save some water. Okay, now. Okay - the bottom 10 centimeters -
SCHMITT Can I get your bag - I left my camera off when I - well, shoot, I didn't take a picture of the trench after I dug it. Let me take one shot.
CERNAN Is this the bottom.
SCHMITT That's the bottom.
CERNAN Okay, the bottom is at 548. It's very cloddy - looks very much like the surface we're standing on except it clods up quite a bit more. Did you tell them anything about the trench itself?
SCHMITT I told them - I talked to them a little bit about it.
CERNAN Okay.
SCHMITT It looked a little coarser grained, but that's all.
PAO EVA time, 3 hours 50 minutes.
CERNAN It sure holds a nice wall, though.
SCHMITT Yep.
CERNAN That's the kind of wall I expect those core tubes held.
SCHMITT I know it.
CERNAN Okay, scan with the upper - let's see - what'll I do - scan sample in the upper half centimeter. Maybe a centimeter deep.
SCHMITT Okay.
CERNAN Can you hold it?
SCHMITT I'm putting it in your bag.
CERNAN Do you think it will fit in there?
SCHMITT Well, there's no choice right now. let me see if these little ones will fit in there. Stand by, I want to put this one in there too.

CERNAN That's in bag 549.
CAPCOM Copy that.
CERNAN Okay, try again. Okay, the upper - below
that scan the next 5 centimeters.
SCHMITT Put it down, Gene. Move it over.
CERNAN Well, I can't turn it. 550.
CAPCOM Copy that.
SCHMITT And the next 10 centimeters down - Can
you get this one too?
CERNAN Yep. Now I got it. Get your bag.
SCHMITT Okay. Okay, that was the next 10 centi-
meters and then the first sample, of course, was the 10 centi-
meters below that.
CAPCOM Roger. Copy that.
CERNAN And that bag is 551.
CAPCOM Okay, copy that. And we're ready for
you guys to move out.
CERNAN Okay. You need to get a pan here while I
clean up the Rover you can get a (garbled) your after (garbled)
of pan. I'll get the GT and clean up the Rover.
SCHMITT I will.
CAPCOM That's affirmed. We agree with that.
CERNAN What's the key that keeps - I keep
getting keyed - it sounds like Bob's stepping on his foot mike,
he's so excited he can't stand it.
SCHMITT Okay.
CERNAN Are you done with your gnomon?
SCHMITT Yep. I'll get the pan.
CERNAN You get your pan and I'll get the TG and
clean up.
SCHMITT You took a pan up the hill there?
CERNAN Yeah. I took it way up there.
SCHMITT Well, I'll take it right here then.
Oh, oh -
CERNAN What?
SCHMITT Sample came out.
CERNAN Sample came out?
SCHMITT I'll pick it up.
CERNAN Yeah, your top came open. It's awful full,
Jack. If you can't get it, I'll get it with the tongs.
SCHMITT Go ahead and go to work - I'll get the
pan first. I lost two of them I guess.
CERNAN Yeah, those are the last two I put in there.
You're bag is so full they won't - let me give them a reading
here. Hey, Bob, can I move in on the Rover and then give
you a reading?
CAPCOM Yes. Go on and be careful not to hit the
button while you're doing it.
CERNAN I won't hit the button. It's easier to
do it that way, I don't know why I asked you - I know I can.

CERNAN Even this thing doesn't want to go on it's so dusty. Okay, it's on and it's locked and here's your reading. 670 - 670 117301 - that's 670 117 301.

CAPCOM Okay, we copy that.

CERNAN I've got to dust that thing the next time around. Jack, we've got to do some bag changing here.

SCHMITT Yep.

CERNAN I'll get those things with my tongs. You can't get them - you'd have to bend over. Every time you jump around you come close to losing something.

SCHMITT I'll just take them back there and put them under the seat.

CERNAN Okay. You need to take that one?

SCHMITT No, I got it.

CERNAN Okay.

CERNAN Damn.

CAPCOM You got another one dropped there, Gene -

Jack got it.

CERNAN Another one?

CAPCOM Jack's getting it.

CERNAN Jack, we're going to make a place in here for your - that full bag. Let me put this small can over there and core tube over there.

SCHMITT Have a sample.

CERNAN Okay, let me take your bag off first.

SCHMITT Okay, well you might as well fill it (garbled)

CERNAN Yeah, I am (garbled) Good ole (laughter).

SCHMITT Okay.

CERNAN It's off, let me fill it.

SCHMITT Your bag isn't in much better shape.

CAPCOM Roger, we'd like to have you check the Commander's bag. You might put them both under the seat there.

CERNAN Well, we're running out of bags, aren't we?

SCHMITT Okay, we've got one bag left - we should have there - it was on the gate, right?

CERNAN Okay. Yeah, we could have had it under the seat. Okay, bag number 4 - bag number 4 is absolutely full - and it's under Jack's seat.

CAPCOM Okay, I suggest that you take the other bag that's on the gate there and put that on either you or Jack and also the Commander's bag is pretty full also, we suspect.

END OF TAPE

CERNAN Why don't you put it on me. Mine get full faster.

CERNAN Somehow.

CAPCOM You might check, Gene. Try again later.

CERNAN Help me.

SCHMITT Stay there, stay there. I'm trying to get the bottom rock.

SCHMITT Oh, I'm sorry.

CERNAN Alright. Check that he's got about six samples to go.

CAPCOM Okay. And -

CERNAN And I just want to be sure that it locked down.

SCHMITT Okay

CERNAN Jack, turn to the left so I can get this other hook.

SCHMITT Okay.

CERNAN It's not coming I guarantee you that.

CAPCOM SEP 5 is one with the LMP if you want to pick it off the gate.

CERNAN SEP 5 is on the LMP.

CAPCOM Okay, copy that.

CERNAN There is nothing on the gate.

SCHMITT Well, I think that'll stay down, but it's not very good -

CERNAN Okay, I've got one more loose sample that I'm going to throw in the big bag back there.

SCHMITT A local one, you mean?

CERNAN Yeah.

SCHMITT Well -

CERNAN Well, let me leave it under your seat. Now, let's - can I put a bag around it? No, it's got a bag around it - it's all bagged. (garble)

CAPCOM While Gene's doing that, why don't you read the SEP temperature, or somebody read the SEP temperature anyway, and close the blanket.

SCHMITT Okay, I'll do that.

CERNAN Okay, Bob. Let's see, you got your reading -

SCHMITT One two zero, Bob, one two zero.

CAPCOM Copy, one two zero.

CERNAN Those blankets just aren't staying closed. Okay, I guess we're ready to head out, do you agree?

CAPCOM Okay, and Gene, when you go to change the - when you go to change the LCRU, we'd like you to turn it to OFF, O F F, on the power switch, the internal power, the external switch. And we'll be reading you through the LM. It will give you a change to cool down the LCRU on the way home from station 9.

CERNAN Alright. And Houston, what's the temperature limit on the DSEA?

CAPCOM Stand by, Jack.

CERNAN Do you read us, Bob, through the LM?

CAPCOM Roger, we read you through the LM, do you

read us through the LM?

CERNAN Yeah, not as well, but we're reading you.

CAPCOM Okay, and the temperature limit, Jack, is 160. We'll just leave it as it is until we get back to the LM.

SCHMITT Okay, I was going to say, we could take it out and put it under the seat or something, but that sounds all right.

CERNAN Okay, an EMU status check. I'm at 3.88 and I got 48 percent, no flags, and intermediate cooling.

CAPCOM Copy that.

CERNAN And the LMP - is at 47 percent, no flags, 3.86.

SCHMITT Hey, Gene.

CERNAN Yeah.

SCHMITT What - Well, Bob, I guess - remind us to change the LRV sampler at the next station. It's almost out of bags.

CERNAN Well, let's do it next time around.

CAPCOM Okay, when you get on, Jack, you can give me a frame count as you start moving.

SCHMITT Yep.

CERNAN Hang on. Need some help.

SCHMITT Nope.

CERNAN Go down hill, get your feet down hill.

SCHMITT Yep.

CERNAN Let me help you. Watch it, there's a crater right behind you.

SCHMITT I got it.

CERNAN I got it.

SCHMITT Here, here. Grab my hand. Now just push up on my head.

CERNAN Yeah, hope I don't do it too hard. Going backwards.

CERNAN Alright, just push up. Okay.

CERNAN Okay.

SCHMITT Boy, are you - you got your pockets completely filled with dirt.

CERNAN Well, extra samples.

SCHMITT Do we throw those pockets away this time around?

CERNAN Extra sample.

SCHMITT Are you a mess.

CERNAN Well, that one was coming for a long time.

SCHMITT My hand's already tired from dusting you.

CERNAN That one was coming. I keep trying to blow the dust off my camera which is very frustrating.

SCHMITT Very ineffective, too Okay.

CERNAN Okay. Do we try that trick, again? You know that happened on an upslope getting on the Rover. Okay, I'm all locked in. Let me know when you are.

SCHMITT How come we don't have to point any charges? I guess the last one - I remember when that one is.

CAPCOM We'll deploy one at station 10.
CERNAN Okay, we're heading to station 9 by about
267. Okay, and you're reading us through the LM so I won't
worry about the low gain. We're powered up, switch is on.
Okay, I'm gonna make a turn to the right.
CAPCOM Okay, and the updated headings since you're
at the north end of station 8 will be something like about 240.
CERNAN Okay, Bob, 240.
SCHMITT Bob, I think gray sample here of
Sculptured Hills. You're going to have to tell a tale combined
with the observation that most of the blocks we saw were, like
Gene sampled, looked like sub-floor gabbro. It's conceivable
that the Sculptured Hills could be the same kind of material.
I think it's fairly clear that the boulder population does not
resemble the Massif population at all.
CAPCOM Okay, copy that.
SCHMITT Heh, heh, heh.
CERNAN Have we been riding on this downslope all
the time?
SCHMITT Yes, but -
CERNAN And hadn't said anything, huh.
SCHMITT Scary, isn't it?
CERNAN Man, I'm glad I'm driving.
CAPCOM Okay, Jack, when you're not holding on with
two hands, we'd like the frame count from you.
SCHMITT Wait a minute. Yeah.
CERNAN Is that Van Serg over there?
SCHMITT Ahhhh -
CAPCOM You have a bearing of 234 and a range of
2 decimal 1.
SCHMITT Okay.
CERNAN We got to get around left here and then -
SCHMITT (garble)
CERNAN Yeah, and then head on more westerly.
SCHMITT LMP frame is at 80.
CAPCOM Copy 80.
CERNAN SWP or Bowen I mean. Bowen I guess.
SCHMITT Well, yeah that SWP over there. Bowen is
out here ahead of us.
CERNAN Yeah.
SCHMITT Bowen - Bowen is much of a crater on the
map.
CERNAN 225 - what did you say, Bob, 225? what?
CAPCOM 2342.1. Heading ought to be about 240,
240 for heading to there.
CERNAN Did you hear him?
SCHMITT I didn't hear him.
CERNAN 240 -
SCHMITT You're not reading him?
CERNAN What did he say for bearing and range?
That's what I'm interested in.
CAPCOM 2342.1.

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CERNAN Okay, I got that.
PAO Station 9 is 2.3 kilometers from station 8
and we estimate driving time 18 minutes.
CAPCOM Okay, and we think you're even further north
as I was saying - maybe about 215 if you're heading for
there.

CERNAN Okay, Bob, I'll find it. 2342.1.
CAPCOM Roger.
SCHMITT And all the big blocks still look like
sub-floor from the Rover. The big blocks in here are only
about a third of a meter in diameter and there's some rounded
and some angular. Okay, we're up on the plains again now just
off the brink and slope.

PAO Station 9 is Van Serg crater which could
be of volcanic origin.

CERNAN I sure think that looks like outcrop down in
the East Massif on the lower slopes if it were the high albedo.
Doesn't it?

SCHMITT Yeah, it does.

END OF TAPE

SCHMITT one of my guidelines for the geophone deployment.

CERNAN There's some more of the blue gray rock here in the east end of the South Massif down low.

SCHMITT Yeah. It looks like it might have been a slump block or something.

CERNAN Yeah, you can see it's blue gray because of contrast with the light mantle.

SCHMITT Yeah. It might be a slump block, or something like that.

CERNAN Jack, I want to go to the left.

SCHMITT You going to go soon? (Laughter) Need 2 trees

CERNAN No, I'm going over here, it's closer.

SCHMITT Okay, that's probably Bowen there. Don't you think?

CERNAN I - think - well -

SCHMITT How about a range in bearing.

CERNAN (Garbled) get too far east. Okay, it's 2283.4. And we're moving along at 10 to 12 clicks. That's all it'll hack.

CAPCOM Copy that. How about an amps reading. We haven't had one of those for a couple of -

SCHMITT Starting to rain again. Got a crater ahead of you.

CERNAN Oh, boy.

SCHMITT Downsun isn't much easier than upsun.

CERNAN It's just easier on the eyes. Just can't see anymore that's all. You don't have that static, huh?

SCHMITT No. Let's see if we still have an antenna. I haven't looked recently.

CERNAN Hope there's no holes in the high gain.

SCHMITT Might have hit it on a rock. Oh boy.

CERNAN Okay, the - we're back into the mantle area population of fragments is still 1 percent or so. The crater off to our left which is at 227 and 3.

SCHMITT What is that 3.1 -

CERNAN 3.3; 22733. Is a very good sized depression, but it's completely mantled, there's no blocks showing in the wall at all. How do you read, Bob?

CAPCOM Loud and clear. We're listening.

CERNAN Now there's that crater in the wall of that depression or near it and it has one big block in the side as if it penetrated the mantle and exposed some of the wall of the depression. Just about a 30 meter crater. Valley of Taurus-Littrow is not plainer.

SCHMITT No, it isn't.

CERNAN I'm glad we changed it to subfloor, instead of the plains unit. (Laughter).

CERNAN Okay, we're in the inner wall of the depression here and the rocks still look like subfloor gabbro. Boy, there's certainly not much variety. General there's a few exotics.

SCHMITT Oh, now that's got to be Cochise. Ah, look at Cochise.

CERNAN That's Cochise.

CAPCOM Roger. We think you're coming up on Cochise.

SCHMITT Let me take a couple pictures while we're looking right at it.

CERNAN Swing right. Swing right. Bob, we are on the northeastern rim of Cochise. I'm going to work my way around the other side. And Bob, looking at the western wall of Cochise, I can see a contact within the subfloor between a albedo units, one of which is a light tan gray and the other is a light blue gray. May reflect the two kinds of subfloor gabbro we've already sampled. Vesicular and nonvesicular. And that contact looks like it was dipping - a fair dip in the wall but to the north. And the west wall dipping to the north about 20 degrees.

CAPCOM Okay, copy that. Which one's on top? Can you tell?

CERNAN Yeah. The blue gray's on top. I'm sorry.

CAPCOM Thank you. And you got a bearing and range there at the rim of Cochise?

CERNAN I took a picture of it. Okay, we're at 228 3.0 and we're headed south and not quite on the east rim.

CAPCOM All right.

CERNAN I'll give you a hack at the east rim.

SCHMITT Bob, I got a picture of that contact so, I took some pictures right into Cochise when we were coming up.

CERNAN Good, it'll show on yours too, I hope.

CERNAN Okay, we're sort of on the inner - mark 2302.9, we're on the east rim.

CAPCOM Copy that.

CERNAN Well, we're sort of inside the east rim a little bit.

CAPCOM Well, don't get too far inside.

CERNAN We're half way between the rim and where the blocky wall starts.

CAPCOM All right. Copy that.

CERNAN Did you get that, Bob?

CAPCOM Yeah. We got that.

SCHMITT Cochise is much like Horatio and actually more like Camelot although not as blocky in the walls in general in that it has blocky walls but a mantled rim. Again all the blocks I see in here are big ones and blocks down to about 20 centimeters are subangular in general and appear to be the - have the appearance of the subfloor gabbro. Although most of the small rocks are not do not appear to be highly vesicular.

CAPCOM All right. We're copying that all.

CERNAN We're at 232 and 2.7.
CAPCOM Roger, copy that.
SCHMITT Watch it.
CERNAN You know what happened there?
SCHMITT What?
CERNAN I was just about to take a picture and the
minute you take your eye off anything -
SCHMITT Yeah.
CERNAN Yeah, I got another view of that contact, and
let's put that - let's put that on the northwest wall of Cochise
and dipping to the southeast.
SCHMITT All right. South and east is to our left -
CERNAN No, no no no no. Put it on the northwest
wall dipping to the northeast.
SCHMITT Yeah, that's right. See that Geno, can you
see that over there?
CERNAN Oh, yeah I can see it now between the gray
and blue gray?
SCHMITT Yeah.
CERNAN Oh, yeah. Yes I sure do.
SCHMITT Can you swing in there and let me get another
shot of it?
CERNAN You bet you.
SCHMITT Yeah, that's a good view right here. Okay
now, I need to have you go left.
CERNAN Okay. I got two of them in there too.
CERNAN Look at that rock right in front of us. It
looks like a contrast between a blue and a gray.
SCHMITT Oh, yeah, there it is. Yeah you're right.
CERNAN We can't get down to it but take a picture.
SCHMITT Well, I think we - I think we've got that
relationship.
SCHMITT I think we got it at station 1 -
CERNAN That's a big beautiful boulder on the -
SCHMITT Yeah, that's -
CERNAN In the rim - inner south rim of Cochise -
it's a single block.
SCHMITT That's how you mend your tires.
CERNAN Man, that's what it's for. Boy that's a
mound - oh man would that be -
SCHMITT That might be glass covered. That might be
glass coating the way it sort of hangs on the outside there.
Hard to say.
CERNAN We're at 234 2.5.
SCHMITT Starting to sling dust. I wonder if we've
lost our fender.
CERNAN No, they're on there tight. (Garbled)
SCHMITT There it is.

END OF TAPE

SCHMITT There - there it is. Betcha.
CERNAN Yeah, I think you're right, 'cause
that's just about the right place. Let's see, 234 okay,
and 2 point 1 is where we want to go and I have a 230 2
point 5. Okay our - pretty close - our block population
in here now on the south rim of Cochise and up ahead of
us looks like it's up to 5 percent and it all looks like
subfloor light to tan subfloor gabbro to tan grey.
You don't see much blue grey, not out on here.
SCHMITT There's a recent hit.
CERNAN This Rover is getting tested for what
it was built for now.
SCHMITT Yeap.
CERNAN Now, I'll tell you it handles, just
the way it's advertised. Maybe even better.
CAPCOM Okay, we think you guys are getting to
the point where you ought to swing a little bit west to
make the 2, 3, 4, 2.1.
CERNAN Yeah, I am, Bob.
SCHMITT We got that gabbro.
CERNAN Bob, that's my fix - I'm just navigating to
it.
CAPCOM Okay, copy that.
CERNAN I know where when I get there.
SCHMITT You'll never tally ho on Shorty, I mean
(garble) How about you there, Joe. Thanks.
CAPCOM Let's not prejudge the (garble) to
much.
CERNAN You want 2, 3, 4, 2.1, okay.
CAPCOM (garble)
CERNAN You wonder like our wander factor in here
has got to be 50 percent.
CAPCOM Copy that.
SCHMITT Bob, you're being cut out, I can't tell
what you're saying. Is that where we want to go, over there.
CERNAN 2, 3 -
SCHMITT Well - good, then we've found the crater.
CERNAN 2 3 4, 2 3 2 -
CAPCOM It doesn't make much difference, 17 -
Do you see van SVR, that's what we want.
SCHMITT I may wander over that way, that's where
I want to get but I couldn't go there because of that -
there's a different looking rock there.
CAPCOM Remember, we were talking about parking
on the southeast rim.
SCHMITT Yeah, I think you're going to have to
bear right.
CERNAN Yeah, I've got to get through this
field though.
SCHMITT I know (laughter).

CERNAN Hey, Bob, we're still primarily in an extreme black field here now it its up to a 20 per cent cover and fragments mostly the subfloor. Some of it looks quite highly shattered. There's - I just saw one piece that looked like a white anorthosite rock.

SCHMITT How's this look to you.

CERNAN We go further up there, I guess. Let me go further up there.

SCHMITT Well, okay, get further southeast - a little higher but you don't have to over do it.

CERNAN There are - there is some greyish rocks that are - oops - I bent it.

SCHMITT Barrack coming up here. I turn to the right and park right here.

CERNAN that have a some what of a swirl texture. Okay, Bob, we're at 230 2 point 2.

CAPCOM Copy that. Copy your park.

CERNAN Yeah, What did I say 230 on that. Yeah, bearing is 230 2 point 2 and I'm parked on a heading of 3 2 0 which gives you a better view.

CAPCOM Copy 3 2 0 for the parking.

CERNAN Yeah, 3 - 3 3 0.

SCHMITT Oh boy, it's getting harder and harder. Got it in a knot also. Don't know what's wrong with itI it now, I might have got it twisted. Here let me look at it. Got a hook but not so I can get it undone. Here let me look at it.

CERNAN I'd say stay put, but I don't think you have any choice.

SCHMITT AH ha, that suddenly just curled under, that's where we're getting the dust - starting to warp, I guess those other sectors, talking about warping, did I get it twisted or something.

CERNAN Yeah, you did twist it when you put it on. Okay, squanch down.

SCHMITT I'm squanched.

CERNAN Okay. Got one twist in it.

SCHMITT Boy, that makes a difference.

CERNAN Sure does. Here, your foot pads down too.

SCHMITT I'll get it. It's lost it's stiffness in there. Hey - hey, I guess now I'm flying for Shorty, huh. Hey VAN SVR. 2 powers on -

CERNAN That third looks like a blocky rim fresh impact crater right now.

CAPCOM Okay, we copy that. How about cupping your feet.

CERNAN (Garble) Don't worry.

CAPCOM And, Gene, before you go away, we'd like the rest of the Rover readouts, like batteries and how about a SEP temp readout before one of you guys leave there.

CERNAN Can you get that on that side, Jack.
Could have TV.
CAPCOM Rog, we have it and I'm sure that Ed
would like a good dusting job up front.
SCHMITT Well, there's so much.
CERNAN I'll dust it if you can't read it.
SCHMITT I've got it.
CERNAN I'll get it - just over the gauge. It's
about 1 2 - 125 on the SEP.
CAPCOM Okay, copy that.
CERNAN Boy, everything is really bad now.
SCHMITT The fender -
CERNAN Yeah, the fender dug under, see if you
can straighten that out.
SCHMITT Okay, (garble) 8 2 and 8 0.
Battery 1 22 at off scale low. Forwards are 2 1 0 2 4 0
Rears are 2 2 5 at 2 2 2 0.
CAPCOM Okay, we copy that.
CERNAN That's just a sample of the kind of
dust we would have got, Jack, if we hadn't of had that
fender yesterday. Fender's almost worn out.
SCHMITT Can you get a dust brush and we'll
check our camera. Stay where you are and I'll give you
a (garble) wherever you are.
CERNAN Okay. Got it. Okay, how many bags do
I have.
SCHMITT i don't know, but I've got a lot of
dusting to do here. Do you have a lot of bags.
CERNAN Yeah, I must have. I've got 4 of
them is all.
SCHMITT I'd better change my bag. Can't even
read the Rover.
CERNAN Yeah, I have an empty bag on me now,
right, collection bag.
SCHMITT Empty.
CERNAN How much time do we have here.
CAPCOM Okay, 17, we're looking at a nominal
station 9 here. You've got about 2 5 minutes remaining.
CERNAN No such thing as a nominal station
anymore.
CAPCOM This may be the first and only one of
the traverse.
SCHMITT Geology won't let it be nominal. Hey
I've got some new bags, Bob.
CAPCOM Okay, we copy that, Jack.
SCHMITT And I guess I'm pretty good on film -
CAPCOM Okay, and you're going to get a radio
(garble) here and so you might check your Rover sample bag
supply.
SCHMITT That's right, I want to take that.

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CAPCOM And you might give me frame counter
check to make sure you're okay.

SCHMITT I just did and it's 123.

CAPCOM Okay, good enough.

CERNAN How do you want the SEP blankets?

CAPCOM Leave them closed, please, Gene, as
closed as they'll get.

CERNAN Closed.

END OF TAPE

CERNAN We been riding with this thing off?
SCHMITT What?
CERNAN That.
SCHMITT Yeah, it should be off?
CERNAN It is. Doesn't seem like it'd get much
data that way.
SCHMITT Even if it's hot?
CAPCOM Yeah, but it's automatic. (garble)
when you get to 508. So it's no good anyway.
CERNAN (garbled)
CERNAN Are you kidding. We're - oh, boy.
CAPCOM We've been hoping all day - it's been
off all day. We've been hoping that it would - since
station 6, we've been hoping that it would cool down
so we could get some more data, but it's not obviously.
SCHMITT It's not going to make it, Bob.
CAPCOM That's obvious by now.
SCHMITT That's a shame. This is going to look
like a geological survey expedition. The vehicle's are
all covered with dust.
SCHMITT On what's in there.
PAO EVA time 4 hours 27 minutes.
SCHMITT I don't think I can read that unless
I dust it with a lens brush.
SCHMITT Okay. Get my - Help me. Okay, can
I get by you here.
CERNAN My bag look alright to you.
SCHMITT Yeah, it's still closed.
CERNAN Okay.
SCHMITT Okay. What are we going to do here.
We're going to go up there and sample on the rim, the walls
and the floor and miscellaneous and -
CERNAN Well, we are on the rim.
SCHMITT - then you're going to take 500 milli-
meters when you get back to the Rover while I do a radial
sample.
CERNAN Okay.
SCHMITT But the - the first thing we do is
go up to the crater.
SCHMITT Bob, I think the mantle objective here
really is imaterial and - because there are blocky ejecta
around the crater covers - oh, boy, well, it looks like it extends
several hundred meters out from the rim. Say a couple of
hundred meters.
CAPCOM All right. Copy that, Jack.
SCHMITT We're quite a ways - we're pretty
close to the rim.
CAPCOM Yeah, we can see that.
SCHMITT We're pretty close - I'll go up on

SCHMITT the rim, Gene, and see what we've got.
SCHMITT Tiptoe through the tulips -
CAPCOM Okay. Let's get grabs before you guys
leave.
CERNAN I'm getting it right now. Is there
anything else you want me to do while I'm here.
CAPCOM Negative.
SCHMITT Sure look like shock rocks to me.
CERNAN Lot of glass splattered on some of these,
Jack.
SCHMITT Yep.
CERNAN We might even find some shattercones.
But don't tell anybody.
CERNAN Well, I'll say one thing for Old Man
Serge it's blocky. Whoo $\frac{1}{2}$ Mark gravimeter.
CAPCOM Copy that.
CERNAN Bob, this is about - I think this is
the only clearly - well I won't even say that. This is at
least a blocky - a large blocky rim crater. But even it
has the mantle dust material covering the rim, sparsely
buried rocks, and it's down on the floor, as near as I can
tell. And on the walls. The crater itself has a central
mound of blocks that's probably 50 meters in diameter -
that's a little high - 30 meters in diameter, It's - many
of the blocks are -
CERNAN Holy moley $\frac{1}{2}$
SCHMITT - intensely shattered in that area, as
the ones that are on the wall. I don't see any sign or
organization of the blocks in the walls right now. There's
a possibility that on the west wall there's an indication
that there's slightly darker gray rocks starting about half
way down the crater and that's - that level is coincident
with what appears to be a bench on the northwest wall.
And that bench - hints of that bench - it's not continuous
but hints of it are around on the north wall and I think
right below us on the southeast wall. The - We'll start -
the rocks are pretty badly broken in many cases and - well,
I haven't seen any real glass yet. We'll start at them looking
now a little more carefully.
CERNAN That looks like a breccia right there.
In front of us.
SCHMITT Yeah, there's some interesting patterns
on the surface.
CERNAN Stand by.
SCHMITT Wait, wait, wait. Okay. Sorry, Geno,
but -
CERNAN Okay?
SCHMITT Okay. Afraid I haven't been doing my
duty on locators occasionally.

CERNAN Do that?
SCHMITT Yeah, I got it.
SCHMITT Okay, Gene's there in a about one of the -
CERNAN There you go.
SCHMITT - very intensely fractured rocks and
it comes off in small flakes. Let's get this one because
this will be the best oriented one for documentation plus
why don't you get that one you've got inside there.
CERNAN Yeah, I am.
SCHMITT Got a bag?
SCHMITT Bag 568 is a fragment from the surface.
That's the corner I think, off of a block that Gene docu-
mented here. We'll get another sample that'll be from
inside the block.
CERNAN Yeah, but that's real easy.
CERNAN There's a whole big - I got that just
as it is. Well, put it in your - put a bag around one end
if we can here the other end is smaller.
SCHMITT Yeah, let me hold this end. Let me
hold it and you put the bag on.
CERNAN That's a breccia too. That's -
SCHMITT Well - See that. See the white fragment
there?
CERNAN Yeah.
SCHMITT It's certainly got a lot of very small -
CERNAN It looks like this big one over here.
SCHMITT You know, it might be that the - these
are - might be pieces of the projectile. I don't know.
SCHMITT Cause it doesn't look like it's - it's
not subfloor.

END OF TAPE

SCHMITT Okay, pin it down.
CERNAN Well, that's wrapped in - if you put it end
down it may stay in the bag.
SCHMITT I doubt it. What's the number?
CERNAN It's a 480 and it's a relatively tabular
shape and it's about 10 inches long -
SCHMITT It's gonna - and it's highly pliable.
It breaks apart.
CERNAN Oh, not so much.
SCHMITT In small chips. Well, can - you did it
with your hands there - I call that being pliable - compared
to what we've seen anyway.
CERNAN Okay and let me get an after of that -
SCHMITT (garbled) soil - soil right over here.
SCHMITT Okay, the soil next to the boulder down
to about 3 centimeters -
CERNAN That's in bag 569.
CAPCOM Copy that.
CERNAN Okay.
SCHMITT And the soil and chips about two-thirds
of a meter from the boulder - are in bag 570.
CAPCOM Copy that.
CERNAN Okay?
SCHMITT Let me get over here. You're going to
step on your gnomon there.
CERNAN Ah, I wouldn't step on my gnomon.
SCHMITT Come on. - Okay. There very clearly is
a central mound and now that we've looked at this one the
mounds looks like it's composed of grey fragment breccias
much like what we've just sampled. Dark grey, then again
it might be - related to the projectile. Now we've got to
see if there is sub-floor up here or whether we're dealing
with another unit somewhere. Get your after -
CERNAN Okay, I don't see any -
SCHMITT - more coherent rock - this looks like sub-
floor.
CERNAN I don't see any orange material either.
SCHMITT Not yet.
CERNAN This particular rock we've sampled has
tabular fractures and in one-half of the rock they are defin-
itely oriented.
SCHMITT Boy, I'll tell you, I don't - There's more
dust on these rocks. It's harder to see a fresh surface.
They're not as clean. That's sub-floor.
CERNAN Hey, even the floor of the crater is mantled
down there.
SCHMITT You know, that seems - yeah - that seems
like a - what you got? A piece of glass?
CERNAN Yeah, I think it is glass. At least it's
glass covered - just glass covered. Houston, I've got an
undocumented sample. It's about 2 meters left of where we just
sampled. It's a glass covered - oh - baseball size rock in 571.

CAPCOM Copy that.

SCHMITT A lot of these blocks up here, Houston, are - particularly the more fractured ones - but even some that aren't, are a grey matrix fragment breccia and it looks like really the fragments are quite fine. There are no - on the rim anyway, we haven't seen any large fragments. The largest I've seen is about 2 centimeters. But down in the mound you can see some fragments that are probably half a meter in diameter.

CERNAN Jack, are you going around that rim of the crater up there?

SCHMITT I was just looking at rocks.

CERNAN Well, okay. We want to see it before we leave back there.

SCHMITT Oh, yeah. We need to see it - we can get some of the sub-floor - I'm not sure I understand what's happened here, yet. This should have brought up sub-floor according to the theory and it hasn't.

CERNAN That looks like some of the - look at some of the breccias - the blue breccias with the white - look at those clammy white -

SCHMITT With the fractured place with the white -

CERNAN Yeah - inclusions.

SCHMITT Down there.

CERNAN Yeah, down in the floor, Jack.

SCHMITT Yeah, it has that appearance all right.

Hey, Gene, do you see that rock?

CERNAN Yeah.

SCHMITT Isn't that rock fractured in sort of a pyramid shape down there? Out here on the - Right, right end of the floor down there - that big one? It's sort of pointing west.

CERNAN Yeah, that, there's another one that's fractured (garbled)

CAPCOM Roger, Jack, and Gene, we'll be moving from here in about 10 minutes so we probably better be turning back toward the Rover unless you're seeing something really great out there.

SCHMITT Well, hey Bob, we ought to find out whether or not - whether - what the rock is here if you've got a little time.

CAPCOM Rog. But you got 10 minutes, I'm just telling you to start thinking about getting back.

SCHMITT Yeah, we're always thinking that way.

CERNAN Okay, Bob. One thing I noticed we do uncover - there's a lot of - 2, 3, 4 millimeters size fragments of glass we're kidding up all over the place.

SCHMITT Yeah. Hey Gene,

CERNAN Little pieces of glass - almost like (garbled)

SCHMITT Gene.

CERNAN yeah.

SCHMITT Can you come over here?

SCHMITT I think there's some sub-floor here. We ought to -

CERNAN Okay.

SCHMITT We ought to try to document it but I tell you, most of the rocks are the fine fragment breccias.

CERNAN Let me see if I can't get one of those -

SCHMITT There's some glass.

CERNAN You see if they're like (garbled)

SCHMITT (Garbled) eyeballs or whatever they are.

SCHMITT I think we can get some over here.

If you're careful coming over here we can get glass that looks like it may have crystallized in place there.

CERNAN Okay, I'm talking about those little balls too.

SCHMITT Take it easy - Take it easy.

CERNAN Are you right there.

SCHMITT Yeah, but put your gnomon right over here and we can get that for glass and that for sub-floor. But I'm not sure that is. It may be breccia there - everything is covered with dust here and it's hard to tell the types. Most of the rocks we're seeing are breccias. Make sure that that glass is in your stereo. Okay, be careful with it. Oh, shoot.

CERNAN I don't have any bags so - Okay, the glass, it looks like a glass of glutenate - Oh no -

SCHMITT Did it break? Good. I think that will survive going back now.

CERNAN Okay, it's a - Bob, the glutenate is going to be in bag 481.

CAPCOM Copy that.

SCHMITT And it looks like a - almost like a (garbled) type of bomb, if you'll pardon the expression.

CAPCOM I will. I (garbled)

SCHMITT It's an aggregate of glass in - it's a pile of about 4 fragments, much like the one we're sampling.

CERNAN Jack, we want to get a good scoop sample here maybe we can get some of those little fine pieces of glass -

SCHMITT And it looks like it's in place from the day it was born.

CAPCOM Copy that.

CERNAN Oh - (garbled) I'm having a time with this one.

SCHMITT A piece of that rock right behind it.

CERNAN (garbled)

SCHMITT Want a bag?

CERNAN Yeah.

END OF TAPE

SCHMITT Just not going to be able to get that one in the bag, I don't think.

PAO EVA time 4 hours 45 minutes.

SCHMITT Okay, Houston, my samples in 482 is rock but it doesn't look like sub-floor, it looks like a blue-gray material we've been seeing in breccia-type material.

CERNAN Yep.

SCHMITT I don't think there's difference.

CERNAN Got it in.

SCHMITT Might as just throw them in my bag.

CAPCOM Okay, and -

CERNAN You want a scoop out of here, though, Jack.

CAPCOM 17, why don't we get that scoop sample as the first sample of Jack's radio sample? 17.

CERNAN Okay, that's right, you're getting a radio sample. That's fine. I forgot you were doing that. Oh, man. That's alright, Jack, that won't come out. Just put it in there.

SCHMITT Oh, boy.

CERNAN Let's let that one be the last one.

SCHMITT Here's one.

CERNAN Well, okay. Those are the last ones that you can take. Going to lock?

SCHMITT No, I don't see in my book on that. Okay. Okay, before you go back -

CERNAN I gotta go down after a picture.

SCHMITT And I want to get a pan of this thing - we get a stereo pan -

SCHMITT And you start your radio baffle.

CERNAN Yeah.

SCHMITT You - you take the after from there and I'll go over here and -

CERNAN Okay.

SCHMITT Well, wait a minute.

CERNAN You need a gnomon?

SCHMITT No.

CERNAN Okay.

SCHMITT I'm going to go over behind me and take part of the stereo. Where are you going to take your pan, let me see.

CERNAN From behind me, where we were.

SCHMITT Well, I think I'll just take my radio from here to the Rover.

CERNAN That's great. That's great. Just do that and you'll be right back at the Rover.

SCHMITT And I'll take my pan from here so you -

CERNAN Man, there's about four or five different modes of travel out here. I don't believe it.

SCHMITT What?

CERNAN I think I'm out of film.

SCHMITT You're out of film?

CERNAN 150 and it stopped clicking. Jack, I didn't get the rest of that crater down there.

SCHMITT Okay.

CERNAN I only got it 12 o'clock and around. Oh, shucks.

SCHMITT I can get it.

CERNAN Well, here's what I -

SCHMITT Well, I'm going to be out of film, too, here before long. Okay, just don't worry about it then. Just put it down with your radio.

CERNAN I got a good pan over here. Did you get the crater at all?

SCHMITT I got the right half of it and probably two thirds of it so we're going - I'm just going to have to let that do.

CERNAN Okay, I'm going to see if I can get some 500s while you're doing that.

SCHMITT Say, this isn't going to be an ideal radio samples but it will have to do.

CERNAN Giddy-up and over hill and dale. Da, da, da, da, da, da, da. (More singing)

CERNAN Bob, would you tell me what your primary desires are again on the 500, based upon what we have?

CAPCOM Okay, the primary desire will be the North Massif, the blocks and the trail.

CERNAN Okay.

CAPCOM And while you're at the Rover, they want you to take the gravimeter off again and we'll get another Rover and a - well another surface measure as well, to check against the Rover.

CERNAN Okay. Here's the reading. I think I owe you one of those, don't I?

CAPCOM Roger.

CERNAN 670037801, 670037801.

CAPCOM Copy that.

CERNAN I didn't know we were going to do both of these things. I thought we were going to do one or the other, but if we're going to do it, we might as well do it right. Bob, it gets flashes. Hey bag - stand by - 52 Yankee is at the rim crest.

CAPCOM Copy that.

CERNAN Well, I'll tell you what I'm gonna do. I'm going to use the Rover to steady the 500 and see what happens.

SCHMITT I should have let you take this scoop back. Oh, no. Oh, me, well - shoot - this isn't working out too well, Doctor Parker.

CAPCOM Say again, there Jack.

SCHMITT This isn't working out too well. I've got to get rid of this scoop.

CERNAN Just set it there and take your sample. We'll get it.

SCHMITT I'll take the samples, going back.

END OF TAPE

SCHMITT Just like in training, the scoop doesn't stay locked to the (garbled).

CAPCOM Okay, 17, we'd like you to press on, we'll abort the radio sample. We'd like to leave here immediately if not sooner to head for station 10. Enough of the 500 millimeters Gene. And we'll give you some information here on mags. We need the gravimeter put back on the Rover, if you haven't already. If it's on the ground, we didn't get the mark, but it's probably done by now. And we're going to take the DSEA out of the tape recorder here and we'd like to get that all done pronto.

CERNAN Okay, 85 is the mag count on the 500.

CAPCOM Copy 85 on the 500.

SCHMITT I think that's a smart move, Bob. I don't think the radio samples are going to tell you much here.

CAPCOM Okay. Let's take a -

SCHMITT I don't under - I - I -

CAPCOM Go ahead.

CERNAN Jack, you ought to get a scoop of that dirt though.

SCHMITT Well, there's one scoop - we don't have a scoop of it, do we? Look what's underneath it.

CERNAN No, I don't know what's underneath it.

SCHMITT It's white.

CERNAN Well, I wanted to make sure we got some of those small glass balls.

SCHMITT Yeah, we'll get a scoop of it. (Laughter).

CAPCOM 17, we're anxious for you guys to get going.

CERNAN Okay, here's your gravimeter reading from the surface. 670057101 - 670 057 101.

CAPCOM Copy that.

CERNAN Want me to change my mag at the next station?

SCHMITT Come here, Gene, quickly. We can't - we can't leave this. This may be the youngest mantle over whatever

CERNAN Take pictures of it. I don't have any film.

SCHMITT Was thrown out of the craters.

CERNAN Take pictures of it. Bob, we've got to take 5 more minutes. We'll be right with you.

CERNAN What Jack's doing is dug a trench in the southwest-northeast direction and he discovered about 3 inches below - just below the surface a very light gray material. Possibility here -

SCHMITT Careful, Geno.

CERNAN Yep.

SCHMITT Take that crust.

CERNAN Well, I'm trying - I'm trying to get the upper portion there. There we go.

SCHMITT First 2 centimeters bag 483, the next 5 in 484, ah, get some?

CERNAN I got quite a bit.

SCHMITT That's enough.

CERNAN I got quite a bit.

SCHMITT Here, you got to put that away, don't you?

CERNAN Yeah.
SCHMITT And the next 10 centimeters of the light gray material, be in - probably in 486, if we're lucky. (Garble) get it off.
CERNAN Okay. I think it is 486.
SCHMITT Yeah.
CERNAN 485.
SCHMITT 485. Okay. What did I say 483, 484? Okay.
CERNAN You with us, Bob?
CAPCOM Roger. We're with you.
SCHMITT He's mad at us now.
CAPCOM How'd you guess.
CERNAN Okay, the third sample is in 485.
CAPCOM Copy that.
CERNAN Okay. Whoops, sorry. Bob, a possibility here is that the - this upper 6 inches of gray material in here, is the latest mantling in the area and the light colored debris may be what's left over from the impact.
CAPCOM Okay, I copy. I understand. But we'd like to get you going. In case you didn't get the clue.
CERNAN I know. We're going. Okay.
SCHMITT All right. What else? Magazines.
CERNAN No, we'll change them at the next station. Isn't that right, Bob?
SCHMITT No, I've got to have some. I got to get some or I can't take -
CAPCOM Okay, 17 we need Jack to put on magazine Nancy, and we'd like Gene, for you to pull out the DSEA tape recorder at this station.
CERNAN Okay, I need a magazine too, Bob, I don't have any film at all.
CAPCOM Roger. That'll be a problem if you change yours here. You can change it at station 10.
CERNAN I'll change it here. It's just as easy while we're in there.
CAPCOM Okay.
SCHMITT Okay, you want Bravo, huh?
CERNAN Eravo. I'll get the tape - I'll get the DSEA.
SCHMITT Bravo was outside there, I saw it.
SCHMITT There you go. Let me get this - hold it far enough from me to get this. I can get rid of this all at one time.
CERNAN Oh.
SCHMITT That's all right.
CERNAN I can't put that back in.
SCHMITT Got it?
CERNAN I've got Bravo.
SCHMITT Okay, I got that one. Roll out the dark slide on a Bravo and it's in the dirt. I'm not going to pick it up.

CAPCOM All right, copy that. There's no point in putting them back in. They probably wouldn't go anyway.

SCHMITT Yeah, that's dirty.

CERNAN Okay, I'm changed. And I don't know what mag count is but let me get the DSEA. If this thing is true to form I'm going to have to get in there - I got it. Oh, it tripped. They're on our works.

SCHMITT Hey, we got some rocks in that big bag. Okay, we're done with the SEP. DSEA is coming out. I hope there is something on it.

CERNAN Oh - Jimminy Christmas - I can't even pick up that big bag to close the gate.

SCHMITT I've got to trip that latch with tongs or something to lock it.

CAPCOM Okay, and Jack, Houston. Over.

SCHMITT Go ahead.

CAPCOM Okay, we've -

SCHMITT Go ahead.

CAPCOM We've had a change of heart here again as usual. And we're going to drop Station 10 now that we've heard you so much and we're going to get a double core here. And we'd like to get the - some football size rocks while you're doing that - but double core here and then we're going to leave here and go back to the LM.

SCHMITT You don't want to - you don't want to double core here. I don't think we can do it Bob, it's too rocky.

CERNAN Do you think we can get through that stuff you just trenched.

SCHMITT Well, I'm afraid your rocks all through it Gene. We can try.

CERNAN Let's try.

SCHMITT Well, I don't like to try things that there is a probability of failure on - if you can - you're just going to lose some time. Okay, Mag Nancy is on the LMP's camera.

CAPCOM Copy that.

SCHMITT Hey, this is - you can see the rock population here, Houston. But we can try it.

CERNAN Try it, if we get a single - we get a single out of it.

SCHMITT Oh, you're doing it, huh?

CERNAN I've got it started.

SCHMITT Well you're not even - okay. Not even going to debate the issue.

CERNAN No, it takes too much time debating it.

SCHMITT Well, let's see how much time it takes. I hope you're right.

CAPCOM Okay.

CERNAN And we need a lower out of my bag.

SCHMITT Let me get the core.

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CERNAN A lower out of my bag is all we need.

SCHMITT Watch it you're in a crater hole.

CERNAN Yeah, I want to get it for you.

CAPCOM Okay, we have to have you guys moving in
10 minutes and we'd like to also deploy EP number 5 here.

SCHMITT Okay. I'll start on it.

CERNAN The lower -

SCHMITT What is it, 5?

END OF TAPE

SCHMITT This is a lower, right?
CERNAN Yeap.
SCHMITT You got an upper?
CERNAN Yeap. How did you get 5 out there at
the core.
SCHMITT (garble) and I'll put it - I'll put
that right there.
CERNAN Okay, the lower is 5 0 the upper is 3 7.
CAPCOM Copy. 5 0 and 3 7.
CERNAN Is that 5, Jack?
SCHMITT Yeap.
CERNAN Okay.
SCHMITT Why don't you put it up - well, you put
the nomer away. Put it fairly near that (garble) there is
some documentation there, I'll try to have the pan going while
you're doing it. Okay, Houston, which way you going to drive
out of here.
CERNAN I'm driving out of here -
SCHMITT Left or right?
CERNAN I've got to go right. I've got to
go right.
SCHMITT Okay. Pin 1 is pulled and safe. Pin 2
is pulled - safe. Pin 3 is pulled and safe.
CAPCOM Okay, Jack, and we'll talk to you in
a minute back to the Rover, I guess is the best way. That
doesn't look too hard, Gene, until just now.
CERNAN Thank you.
SCHMITT Oops, looks like you proved me wrong.
SCHMITT The first core was easy, the second
one a little tougher and then it got tough down at the end.
There, I'm getting a picture of you. Okay.
CERNAN Okay.
SCHMITT I got it.
CERNAN You got it from there, okay.
SCHMITT Yeah. Core but it wants to slide out.
It's full. No rocks in it. It looks like just the same
stuff we've been traveling through.
CAPCOM Okay, Jack. I think you'd better help
Gene with that - recovering that core there where the finger
is going to fall out.
SCHMITT You know I think you're right and If
you'll just wait until I finish the pan, that's exactly
what I'm going to do.
CAPCOM Okay, I didn't know what you were doing.
CERNAN Bob, it's capped.
CAPCOM Got ya. Okay.
CERNAN Take the pole. Just hold the handle.
SCHMITT Okay.
CERNAN I'll take this one.
CERNAN It's very - very loose soil, Jack and
it - just any little movement and you'll lose some of it.

CERNAN Let me cap that end. Don't move it.
SCHMITT Uh Oh, you almost knocked some out.
Get your - you know where your thing is.
CERNAN Yeah, but I need you - that - that cap
on you. The last one's gone off the rover.
CERNAN That's all right, I'll stay here. Go
put yours out there.
SCHMITT I won't move it.
CERNAN Any little movement and that stuff
starts -
SCHMITT Yeah.
SCHMITT Okay.
CERNAN Go - turn around, I'll get the rammer.
SCHMITT Okay.
CERNAN Oh, man, even these pins are getting
stiff.
CERNAN Okay, Bob. The top rammed down - oh -
almost half way without any effort.
CAPCOM Copy that.
SCHMITT Scoop's back on.
CERNAN The bottom rammed down about an inch.
CAPCOM Copy that.
CERNAN Okay, Robert, let's see - turn around
and I'll get this.
SCHMITT What was the last thing - let's see -
we had to do?
CERNAN A couple of football size rocks. You
got the DSBD?
SCHMITT I got it. I got the charge. You got
the double core. I got the double core. And I got one
sample of a radial sample.
CERNAN (laughter)
CAPCOM We got a - that's a unique one.
SCHMITT In my pocket.
CAPCOM Have we got the gravimeter back on the
rover?
CERNAN Yes, it's on.
CAPCOM Okay, copy that.
CERNAN And we want to get a large block. Why
don't we -
CAPCOM Okay and -
CERNAN Over here (garble) -
CAPCOM (garble) SESC from the shallow trench.
We'd also like to have you moving in 4 minutes. That's
with wheels rolling in 4 minutes.

CERNAN SESC, huh?
CAPCOM Roger, but we have to have the drill probe.
CERNAN I don't know if we can do that. We can
try it.
CAPCOM We want the wheels rolling in 4 minutes.
I don't think it's practical at this time.
CERNAN Bob, we cannot get a SESC in four minutes.
CAPCOM Okay, cut it out.
CERNAN Let's roll.
CAPCOM Copy that.
CERNAN At this time.
CERNAN Now, I've got to push this latch on a -
on a gate to get it locked - on a pallet to get it locked.
SCHMITT Need some help?
CERNAN Push the pallet while I trip the latch,
will you? Wait till I trip the latch. So much dust in that
core.
SCHMITT Get it?
CERNAN Nope, no, wait a minute. Open it up.
CERNAN Wait a minute.
SCHMITT Okay.
CERNAN Now - now (garble).
CERNAN Trip it.
CERNAN Okay, try it.
CERNAN Lock?
SCHMITT Yep, yeah.
CERNAN Should be locked now.
SCHMITT That got it. That got it. Okay.
CERNAN Got a big rock there too.
SCHMITT Well, you know the thing that amazes
me, is that there's no sub floor around here.
CERNAN I got one here.
CERNAN Okay, I'm about ready to clean up the
rover here.
CAPCOM Okay, 17. What's out there in the
distance on a hillside in a field in view of the camera?
The camera is pointing at it.
CAPCOM Oh, I'll bet that the -
SCHMITT It's out there at a distance.
CERNAN -
CAPCOM That's the flag, I bet, on the charge.
CERNAN Yeah, but it's only - you're looking right at it
but it's only 10 meters away.
CAPCOM Okay, It's hanging in front of the hills.
That's the problem.
CERNAN You're looking right at the flag.

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CAPCOM Okay, it's hanging in front of the hills. We thought we had an artifact or something like that. Okay, press on.

SCHMITT Bob, Bag 486 is a light colored rock taken about 3 meters to the right of the rover. It should be - you should be able to pick it out in that last pan. Unless the focus is bad.

CERNAN Bob, you got all your TG readings?

CAPCOM Roger, we've got that. We'd like to have you climb on.

CERNAN You want the LCRU off?

CAPCOM Roger, let's go to LCRU power off.

CERNAN Okay, Jack, let's -

CERNAN Better get going.

SCHMITT Yep.

SCHMITT You know I don't think there is any sub floor in here. The rocks are so dust covered it's hard to be sure but no rock I picked up looked like sub floor.

SCHMITT Get on there one time.

CERNAN I got three of them that time.

CAPCOM 17, Houston. Do you read me through the LM?

CERNAN Yeah, loud and clear.

CAPCOM Roger. Thank you.

END OF TAPE

(garble)
CAPCOM Roger, thank you.
CERNAN I hope they came out. Okay.
SCHMITT I bet I twist it this time, if I can get
off.
CERNAN Oh, let's see if old twinkletoes can do
it. Jack, there's a big - a big one right there in my floor
pan. That's one I did last time.
SCHMITT Okay, I'm on, strangely enough. Okay.
Let's see. Okay, the charge is off to the right. Yeah, you're
all right. Are you this way or -
CERNAN I see it.
SCHMITT Okay.
CERNAN I bet you they thought there was some more
orange bio over on the hills.
PAO EVA time 5 hours 16 minutes.
SCHMITT Move it a little bit.
CERNAN I don't know where we stand on time.
Well, we've been out about 5 hours and 20 minutes or so.
SCHMITT Where are we headed, now that we are
moving?
CAPCOM That's affirm.
CERNAN Well, I'm trying to get around, trying to get
around a block field here, then I'll head back to the southwest.
SCHMITT Are we going to Sherlock at all, Bob?
CAPCOM No we're (garble).
CERNAN (garble).
CAPCOM And a reminder, Jack, we can get lots of
photos, we've got lots of film left right now.
SCHMITT Okay.
CAPCOM And 17, Gene, I guess you're the one that
took the SEP out, if you could give me - do you remember the
reading of the SEP temperature when you broke it down.
CERNAN Didn't even look, Bob. It was 125 when we
started the station.
CAPCOM Roger, copy that.
SCHMITT That's Gatsby there, I guess huh?
CERNAN Yeah.
SCHMITT It's not - it's not unlike Van Serg though.
CERNAN You know that looks like mantling,
SCHMITT Hopefully we can get a - watch your rock -
there you go - we can get a shot looking back to the northwest
CERNAN Yeah, I'll get that when I -
SCHMITT into Gatsby because it looks like the mantle
braids over the - the side from the southwest. Can you swing
to the right, get up a little closer to the rim, there?
CERNAN Hey here's a couple fragments in spots -
SCHMITT Look at that, see that?
CERNAN Yeah.
SCHMITT See that structure -
CERNAN Yeah -
SCHMITT see how the - see how the mantle braids over
CERNAN Yeah -
SCHMITT from the northwest, can you get that?
CERNAN Yeah -

SCHMITT - and from the southwest.
CERNAN Got it?
SCHMITT Yeah, go ahead, keep going. Good shape, got it.
PAO Station 10 has been eliminated, the crew will head back toward the LM.
SCHMITT Bob, what I'm look at is the northwest portion of Gatsby where there's very very concentrated block field on the inner wall, except where there are on the southwest 3 streams and on the northwest and north a continuous stream, if you will, band, radial band, of mantle and is - appears to be burying that field, overlying and mantling the field.
CERNAN We got some pretty good pictures of it I think.
CAPCOM Okay, copy that.
PAO Distance to the LM, 2.2 kilometers, estimated driving time 19 minutes.
SCHMITT One possibility I guess is that if it's a pyroclastic mantle, that in the lunar vacuum environment with whatever volatiles we're dealing with the stuff becomes extremely fine upon vesiculation. We may have been on it all the time and not known it; as far as recognizing it.
CERNAN As soon as we come through this draw smooth free of any debris or boulders it is on the other side of the upslope.
SCHMITT Yeah, watch it.
CERNAN Bob, do we have an extra EP?
CAPCOM No, we have 2 of them behind you. We're going to deploy - we're going to deploy I'll give you a reading soon on that.
CERNAN Okay - well one I deploy at the end I know, I thought we had an extra one here somewhere.
CAPCOM Okay - yeah that's right - okay that the one we were planning on deploying all along and it's there, we'll be deploying at a range of 0.1, which is just before you get to the SEP.
CERNAN Okay.
SCHMITT I guess Sherlock's coming right over the top over here, I saw it when we were on that other ridge.
CERNAN Hey, you know, there's a lot of bad landing placed around here, that old Sun angle I think shows most of them up. Bob I -
CAPCOM And Geno we were look -
CERNAN I don't under -
CAPCOM at the map here -
CERNAN I don't under -
CAPCOM and if you keep going straight to the LM you're probably going to run into this crater area around San Luis Rey, you probably ought to head somewhat south of directly back to the LM, so we can at least tip the - the

CAPCOM western edge of Sherlock and then pick it up and then go from there back to the SEP, it looks like it might be rather rough there in that dotted line area if you can look at the backside of your map, Jack.

CERNAN Bob, I've already been doing it, I'm at 2441.7,

CAPCOM Copy that -

CERNAN Already been doing that -

CAPCOM Okay -

CERNAN And Bob, about 200 meters back, we crossed back into our standard mantle surface of about 1 percent fragment cover.

CAPCOM Okay 200 meter back -

CERNAN The block field which -

SCHMITT I can see the LM.

CERNAN Yeah, I can see the LM and there's Sherlock where those blocks are.

SCHMITT Yeah, that's the block field, the Sherlock block field, that's right. That is a block field.

CERNAN A big one there.

SCHMITT Yeah.

CERNAN Old Station 10, somebody even called it 10 Alpha in honor of the Apollo Program Office. The -

CAPCOM And Bravo -

CERNAN Apollo Spacecraft Program Office.

CERNAN Oh, that's right, 10 Bravo, I knew I'd never get that straight.

CAPCOM Do those blocks look like gabbro -

CERNAN How fast do you think we're going Jack, with out looking?

SCHMITT I think we're going about 18 clicks.

CERNAN Hey, you're just about right. Seems like the first time we've been able to go down hill. (laughter) not really.

SCHMITT Pull close to this big block if you can.

CERNAN Yeah.

SCHMITT And I'll try to get a reading on what it is. I'll get pictures of it as we come up to it.

CERNAN Yeah.

SCHMITT Boy that's a big one. Watch it (garble) Looks like our old friend the subfloor, isn't it?

CERNAN Yeah.

SCHMITT Vesicular sub-floor, vesicles are about centimeter maximum size that look like they're fairly evenly sorted and the rock itself seemed to be massif.

CERNAN 250 1.4.

CAPCOM 250 1.4.

SCHMITT Okay, we're back into a - we're back into a - about a 5 percent rock cover as we cross the edge of the Sherlock block field.

CERNAN That's Sherlock over that rim over there.

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CERNAN Yeah, yeah.
SCHMITT Once again, all these sub-floor blocks look
as they're buried. Not mantle necessarily except maybe that
one. Can you swing right, just a tad?
CERNAN That one's got the mantle blowing up on it,
isn't it?
SCHMITT Yeah
CERNAN In it's fractures and everything.
SCHMITT That's the best example of that -
CERNAN Did you get a picture of that?
SCHMITT I got it, I got it.
CERNAN Got it, got it.
CAPCOM Okay and all those look like the same
sub-floor gabbro?
CERNAN Yeah, that one's got the mantle -
SCHMITT Watch it.

END OF TAPE

CERNAN Roger. Yes, everything in here so far is the tan-gray subfloor gabbro that I've seen, I haven't - oh there's one over there that's the blue-gray, but blue-gray is not abundant.

CAPCOM Okay, copy that.

CAPCOM And 17, as you're getting closer, we're going to want an LRV sample at 1.1, on the range.

CERNAN Okay.

SCHMITT What are we now - 12.

CERNAN 1.2. Okay, we'll try to get block and soil.

CAPCOM That'll be good.

CERNAN There's a fresh little pit.

SCHMITT Bob, I'm continually impressed by the lack of exotic fragments in here.

CERNAN Hey, Jack. How about picking out there.

SCHMITT Okay, if you head into that little - well that's a crater there -

CERNAN Let me get around it. We can go a little bit further.

SCHMITT I'll go open the platter -

CERNAN Yes, yes.

SCHMITT There are a lots of little fragments over there by that area - ha ha.

CERNAN Any time.

SCHMITT Okay, now swing a shallow turn. Oh, yeah - better hold.

CERNAN Did you get any of those?

SCHMITT Unfortunately, I can't see them.

CERNAN How about that one right in front of you, in front of the television camera shadow. See that little one up there? Right there.

SCHMITT It's real big, I think.

CERNAN Upper right, no upper right. Straight up the line.

SCHMITT Oh, okay, yes.

CERNAN If you can get over there I can -

SCHMITT I can get there.

CERNAN I guess I had the wrong - I guess I wasn't looking at the right one - the shadow is making it impossible to see down there. Now see what you can get. Bob, we're at 25.3 1.1.

CAPCOM Copy that.

SCHMITT If we do another sample, you're going to have to swing right so I can see - I can't see this way.

CERNAN Yes. And 53 Yankee.

CAPCOM Copy that. Is that soil or rock?

SCHMITT That's soil, I can't see to get a rock.

CAPCOM Okay.

SCHMITT Go forward just a little bit, Gene.

CERNAN Okay. Bet you're going to get yourself in a box there.

SCHMITT No, that's alright.

CERNAN Oh, boy, sorry.
SCHMITT Oh.
CERNAN Get it?
SCHMITT I will. Got it.
CERNAN Can't see the LM anymore.
CERNAN Okay, the rock fragments, that's 54 Yankee.
SCHMITT Ohh.
CERNAN Okay, you got a rock right`in front of
you don't you?
SCHMITT I see it. Rolled over.
CERNAN LMP brave - for that sample. Looks like
about 60.
CAPCOM Copy that.
SCHMITT 60, have I taken 60 pictures?
SCHMITT These rock fields are something else
again.
CERNAN Yes, 60. Looks like some of our gray
variety of subfloor up here - around the rim of that little
crater.
SCHMITT You know, I'm starting to think that
maybe the gray relatively nonvesicular subfloor may be deeper
fraction, based on what we saw - actually, though, let's see,
that could have been overturn, I don't know, take that back.
There just isn't much of it around here, although we saw a
lot of it in the wall of Cochise.
CAPCOM Roger, we got that.
CERNAN What do you think this is, San Luis Rey?
CERNAN We're at 252 0.9.
SCHMITT I wouldn't doubt it at all.
CERNAN I'll bet that's San Luis Rey.
SCHMITT Around the east side of it Mariner San
Luis Rey. It's shallow filled with rock.
CAPCOM As close as we can tell, you're at one
or the other of them.
CERNAN Boy, I tell you. Okay, we're at 250.9.
CAPCOM Copy that.
CERNAN Mariner should look pretty fresh.
SCHMITT Boy, I certainly don't see much variety
other than the gray and the tan subfloor variety.
CERNAN There's old Challenger, there she is.
Pretty as a picture.
SCHMITT Boy, I tell you, there's no getting out
of this stuff. You go from one to another.
CAPCOM Okay -
CERNAN I don't know whether I said it or not -
CAPCOM Gene, your range is 0.1, we're going to
deploy the quarter pound charge, and that'll be Jack getting
off to deploy like we talked about last night.
CERNAN Okay. That's EP2, Jack.
SCHMITT EP2, right.

SCHMITT Bob, we're still - we're moving in and out of areas of say 1 percent to 5 to 10 percent blockiness, and when it gets blocky - not only is it more blocky, but we seem to have more of the medium size craters in the range of 20 to 50 meter diameter craters. That may be Mariner right there.

SCHMITT How do you read, Bob?

CAPCOM Loud and clear, loud and clear.

SCHMITT Hey, that surge, let me mention again, was an unusual experience in the plains geology here.

CERNAN That must be part of San Luis Rey or Mariner - one.

SCHMITT Yes.

CERNAN It's pretty deep. Very deep.

SCHMITT Yes, it is.

CERNAN It's really big. We're at 252 and .6.

CAPCOM Copy that.

SCHMITT The crater on our left - that is south of us is a large crater. It's somewhat deeper than craters of the same size that we've seen. And it too, though has - it's blocks - mainly - large blocks - mainly in the walls, although, there are blocks up here in the rim, occasionally up to 3 meters.

SCHMITT That string of blocks over there - that may be it.

CERNAN Yes.

SCHMITT That's an edge of a crater area.

CERNAN Want a picture of that?

SCHMITT Got it. Look at the way that thing's fractured.

SCHMITT Yes, this is the San Luis Rey, Luis complex, cause see how elongated it is?

CERNAN Yes. We're going to cut right through the western half here.

SCHMITT We're at 244.4.

CAPCOM Copy that.

SCHMITT Bob, I may have said early - early on up there at Van Serg that I saw subfloor, but we never did sample any that I know of, and the dust was picking up and I'm just not sure. Breccias were the most obvious thing there.

CAPCOM Okay, most interesting.

SCHMITT It might have been a window in the plains, here, of some kind, but it's strange to see it there with so much subfloor all around it that we saw.

END OF TAPE

CAPCOM And Jack, you going to get a feed water
tone pretty soon.
SCHMITT Got it.
SCHMITT It should be in off now. 252 and .2
CAPCOM Copy that. And as soon as we get to
the 0.1 let's stop and deploy the charge.
SCHMITT There she is.
SCHMITT All right.
CERNAN Okay and then I guess ah - then I'll head
back to the LM I don't go to the - unless you want to go to the
ALSEP.
SCHMITT I think I'm going to.
CERNAN When I go to the ah - Oh you go to SEP.
SCHMITT That's right.
CAPCOM We're going to let you play the ALSEP
game there Jack, we've got a few things for you to do out
there, when time comes.
SCHMITT Okay.
SCHMITT .1 - no - We're almost to SEP. We're
about -
CAPCOM Rog. We'll be just short of SEP.
SCHMITT - - 50 meters from SEP.
CAPCOM Is it short of the antenna?
CAPCOM Well, we'd like to have -
SCHMITT Well you see we get to the end of the
antenna, -
CAPCOM No, no, don't - let's have it east to the
antenna. If we are there let's deploy right where you are.
SCHMITT Okay, we're about 30 meters east of
the antenna how's that?
CAPCOM That sounds great.
SCHMITT Okay, and we're at (garble) 221 and .2.
It'll be 221 and .2.
CAPCOM Copy that.
SCHMITT There's a rock I stood up down there and I
want to get it.
CAPCOM And (garble) number 2, Jack, (garble) in
case you didn't follow is.
SCHMITT Okay.
CERNAN Hey, our gate's open.
SCHMITT It's open?
CERNAN Yeah. But it looks likes everything's
here.
SCHMITT How about the big bag?
CERNAN Big bag's here. Is that the gate or the
pallet?
SCHMITT It won't dare run away.
CERNAN The gate or the pallet?
SCHMITT The pallet. I'm sorry.
CERNAN Well, that's worse.
SCHMITT Seems to ride all right that way.
CERNAN Oh, that dust. It's getting into
every thing.
CERNAN Dum Dee Dum Dum. Okay, I'm going
to leave the gate like it is. Seems to be all right.

SCHMITT Okay.
CERNAN Okay, EP2.
SCHMITT Where is that? Here it is.
CERNAN Hey, Jack, you're just going to walk
back from here aren't you?
SCHMITT I can, yeah.
CERNAN Why don't you just go turn the SEP
receiver off. We did that the receiver's all done.
SCHMITT (garble) the transmitter - but you've got
to come out here anyway.
CERNAN Yeah, I've got to come out here.
SCHMITT Forget it.
CERNAN I can do it.
SCHMITT No, we're just reading ahead, but no
sense. Forget it.
CERNAN One thing I want - Okay, bend 1. Pulled
and safe. Bend 2 pulled and safe. Bend 3 is pulled and safe.
CAPCOM Copy all those.
CERNAN And I'll try to put it into a depression.
I'm going to put in a depression if you want. Okay. And then
I've got to take a pan, huh. Will the locator - Yeah, how about
a locator to the LM?
CAPCOM Be fine.
CERNAN You going to get on Jack, or walk back?
Dealer's choice.
SCHMITT I'll get on.
CERNAN Okay.
CERNAN Okay, locator to the LM. I'll give you
a pan count if I can read it. Ah, 90 - 92.
CAPCOM Copy. 92.
SCHMITT You're going to have to left a little
I guess.
CERNAN Go left?
SCHMITT To avoid the antenna.
CERNAN Oh, we - we don't have to worry about it.
But I will anyway.
SCHMITT Go ahead.
SCHMITT Here I'll take it easy. I'm sorry.
SCHMITT Okay. I want to point out a rock to
you, I set up on end. We need to get into the bag - you can
let me off there and I'll carry it. But drive close enough
so I can reach down and use the focus for support.
CERNAN Where is it?
SCHMITT It's out over here. Between the -
CERNAN On which side of that antenna?
SCHMITT It's ah -
CERNAN Oh, there it is right there.
SCHMITT No it's out, it's on the - it's near
the LM. Here -

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SCHMITT
I already did.

CERNAN

SCHMITT

CERNAN

SCHMITT

Oh, okay, I can go across this thing -

That bag is empty, isn't it.

Yeah, that's one I lost. I mean I dropped.

Look like you got over.

Yeah - yep.

END OF TAPE

SCHMITT I think it's that one there that's sort of dark.

CERNAN Up there, straight ahead?

SCHMITT Yeah.

CERNAN (garble) that must be it.

SCHMITT Yeah.

CERNAN That's it.

SCHMITT Yeah, can you swing over so I can lean on the rover (garble) that's good, no that's good, it's perfect. Okay got it?

CERNAN No, I'd hate to get run over this late in the game.

SCHMITT Well now what did I do that for?

CERNAN (laughter) what did you do, dig it under?

SCHMITT Yeah.

SCHMITT Need your oil changed?

CERNAN Yeah while you're under there would you check my transmission, please?

CERNAN (laughter) Any bubbles on the inside of the tires?

SCHMITT Okay.

CERNAN Have you got it?

SCHMITT Yeah, I got it. Hey Bob I got my rock, it's half way between the SEP and the LM. Wait, wait, let me put it in the big bag - in the big bag.

CERNAN Big bag.

CAPCOM Is it that brown one you saw before, Jack?

CERNAN Okay. Go ahead.

SCHMITT No it's a grey one.

CAPCOM Okay.

CERNAN Okay.

SCHMITT Yeah, I just lost the sample, it's in my pocket I guess. Let me get some tongs.

CERNAN Okay.

SCHMITT Then you can go ahead. I'll walk by you.

PAO EVA time 5 hours 44 minutes.

CERNAN Okay, Bob, I'm back at the LM -

CAPCOM Roger, we have you back at the LM.

CERNAN - 151 4.0 and 001, well wait a minute.

SCHMITT Can you get it?

CERNAN I got to get your bag -

SCHMITT I got it, I got it.

CERNAN - let me get your bag off.

CERNAN I'm reading 80 on the amps, 78 on the amps, correction that's amp hours, voltage is 62 and 65. Battery 1 is 132, (garble) 0, motor temps are 200 and 210 on the rear 200 and 250 on the forward.

CAPCOM Okay we copy that. Okay, and let's - let me brief you here on the close-out tonight, 17. A number of things that we're going to do here that are slightly different. We've got some stuff for you over at the ALSEP, Jack, and I'll get with you when you go over there. Nothing we have to worry about in the meanwhile. When we unload the rover, we're

CAPCOM going to take the SESC out and we want use that to collect the contaminated sample out behind the foot pad there as per planned and when we take the traverse gravimeter off, we're going to want to get both a grav and a bias reading, because the pallet was swinging in the breeze there. Otherwise, let's press on with the close-out and we'll get with you as times change.

CERNAN Okay, Bob, the core tubes are going in SCB 7, I mean - yeah 7.

CAPCOM Okay, I copy that.

CERNAN You should have TV Bob.

CAPCOM Rog, we have TV thank you.

CERNAN Did you get my bag already?

SCHMITT Yeah.

CERNAN Jack?

SCHMITT Yeah.

CERNAN We only have one more to put in here, I'm just going to lay this over here.

CERNAN Yeah, the big one.

SCHMITT Man, there's some big ones in there too. We can get some of that sub-floor.

CERNAN Yeah, there's one in my foot pan too. Do you see it there?

SCHMITT We'll have to -

CERNAN Why don't you leave that go for a minute. Okay.

CERNAN What did you say about the TGE, Bob?

CAPCOM Okay, we'd like to take TGE, of course, as we planned, take it off and we'll try to get both a grav and a bias reading. You might initiate one of them now, we'll initiate another one later on. We've got plenty of time while it's sitting on the ground there to do our thing with it.

CERNAN (garbled)

CAPCOM (garble) feedwater coming up pretty soon Gene.

CERNAN Bob, I already got it and I'm in AUTO, just about 30 seconds ago.

CAPCOM Okay.

CERNAN Okay, how are we fixed for samples? Here's 5 and it's about 1/2 to 3/4 full.

SCHMITT Well, let's dump -

CERNAN We've got to carry SESC up -

SCHMITT - let's dump these -

CERNAN We got 3 -

SCHMITT - got 3 in there, the rover samples.

CERNAN Okay. Okay. We probably ought to put the SESC in there, huh? If there's room for it.

CAPCOM Yeah, let's put the SESC -

CERNAN Where do you want the SESC, Bob?

CAPCOM Let's put the SESC some place where it's accessible to get that contamination sample, we probably want to - to get it before you go off to the ALSEP, but there's no

CAPCOM real hurry on that, we'll see what works best. I'm not sure where the most convenient place for you to put it right off hand is.

CERNAN Why don't we get it now then can have -
CAPCOM right off hand.

CERNAN then we can have this bag -

CAPCOM That's probably -

CERNAN - let's get it now we can get the bag cleaned up -

CAPCOM Roger, there's probably not very many convenient places to put it, that sounds like a good idea to me.

SCHMITT Okay, let me my scoop.

CERNAN Get your scoop, let's get it over with.

SCHMITT Say again Bob, you want that - I don't have a scoop, I don't even have a rake.

CERNAN They're both gone, huh?

SCHMITT Yeah.

CERNAN Use your rover sampler.

SCHMITT Yeah.

CERNAN They both fell off when that thing opened.

SCHMITT Yeah.

CERNAN Here's a full core tube we can't forget.

SCHMITT Yeah, that goes in the -

CERNAN (garble)

SCHMITT - yeah, why don't you get that scoop off and I'll put it over here in 4, I mean in 7.

CERNAN That's a good time to lose it, I'm glad we didn't lose it any other time, if we're gonna lose it, that couldn't have been more ideal.

SCHMITT Yeah.

END OF TAPE

CHALLENGER 7.
CERNAN That's a good time to lose it, I'm glad we didn't lose it any earlier. If we're going to lose it that couldn't have been more ideal.
SCHMITT Well, that was appropriate I guess.
CERNAN We got 2 - we've got 2 empty core tubes. Feel like we took a lot of them though.
SCHMITT We'll get it. We'll use them maybe back here.
CAPCOM Okay, we confirm that. Please go forward (garble) and don't have to worry about bringing back, huh?
CERNAN Here's your thing.
SCHMITT Let's go.
CERNAN We need to get this SESC now and get it out of the way, Bob.
CPACOM Roger. We agree with that.
CERNAN Okay. Minus Z here.
SCHMITT You want it in front of the minus Z foot pad?
CAPCOM Roger. Sort of underneath where you probably had the solar side of the cosmic ray experiment there. Between the SCS - between the foot pad and the ALSEP cores there.
SCHMITT (Garble)
CERNAN I've got about an inch to go.
SCHMITT Okay.
CERNAN Give me it. Sew it up.
CERNAN That's good.
CAPCOM Okay. And both your feed waters are up, 17, so things look good.
SCHMITT Thank you.
CERNAN Would you brush that white thing off for me.
SCHMITT Yeah, here let me get - there you got it.
CERNAN Okay. Take a couple over here.
CERNAN Let me go past the radar. Big job.
SCHMITT Bob, radar's built better. I'm on Frame 96, and the short can sample and (garble) sample is documented by 2 stereo pairs prior to that. And the before is cosmic ray pictures.
CAPCOM Copy that.
CAPCOM Okay, and which SCB is that going in, Jack.
SCHMITT Number 5.
CAPCOM Okay. Copy that.
SCHMITT Okay, the SCB's - the SCB's at 5. That what you have.
CERNAN Yeah, short can's at 5. (garble) SCB.
SCHMITT Okay.
CAPCOM Okay, and while you're doing that -
CERNAN (garble) let me get this -

CAPCOM Remember I want inventories of the stuff that comes off the Rover. And why don't you put it over there by the foot pad, so you can keep track of it.

SCHMITT Okay, I've got the big bag, bag 7, bag 5, bag 4 at the foot pad.

CAPCOM Copy that, we've also got SCB 3 with the (garble) samples in it on the Rover, if you have - if you have some of those today.

SCHMITT No, we emptied those into 5.

CAPCOM Okay, copy that.

SCHMITT Okay, Bcb. the gravimeter's on the surface and you want a gravity read and a bias reading, is that correct?

CAPCOM Roger, we'll get the grav first.

SCHMITT Okay, Bcb. MARK it, let's see where am I -

CAPCOM Copy that.

SCHMITT What did you do with -

CERNAN Okay. Gravimeter - You've got another big rock over here from the - it's in my foot pan, that's from station 9, right.

SCHMITT Yeah.

CERNAN That's what I told them. Station 9 I got a football size rock, and I put it in there.

CERNAN Well, we eventually lost one clamp. Let's see what we've got left on here.

SCHMITT Okay, Gene's football sized rock looks like it might be glass coated. And it might even have a shatter cone or two on it.

CAPCOM Okay, Jack.

CERNAN Okay, I'll let you get -

SCHMITT I don't know what you're focused on.

CAPCOM And -

SCHMITT But here his rock.

CAPCOM And Jack, we're thinking plans here, to change the camera usage at the end of EVA here. And we're going to let you take the Commander's camera out to the ALSEP and get photos that people think we need. And Gene's going to take your camera out and document the geophone when he deploys it. We will not deploy it for the long term experiment however, and we'll bring both back and carry them to the ETB when we get done.

SCHMITT Okay.

CERNAN Okay, we've got to reverse the rolls of the camera here.

SCHMITT While you're getting that, we've got to doff our harnesses. Let me -

SCHMITT Before you take this -
CERNAN Are you going to start loading ETB yet or
not.

CERNAN Well, I'm just about there -
SCHMITT Okay. I'll be right with you.
CERNAN Okay, Bob, I've got the cosmic ray and
the ETB.

CAPCOM Okay, Roger copy that. It's been in
there all along hasn't it.

CERNAN Yep. MAG, Foxtrot, or Freddy, I guess
we change it too. Mag Golf, the DSEA mag Echo, mag Linda,
mag mary -

END OF TAPE

SCHMITT Are you through with the 500?
CAPCOM Roger, we're through with the 500.
CERNAN Jack, where is the cosmic ray? Did you
put that is ETB?
SCHMITT Yes.
CERNAN Okay.
SCHMITT Don't think the 500's working anymore,
anyway.
CERNAN It's working (garble)
SCHMITT There it is - self cycled - 3 times.
(garble)
SCHMITT Okay, here goes scissors. Okay, I'm going
to go get a gravimeter reading.
CERNAN Oh, let's see now - there it is.
SCHMITT Okay, mag Karen is in.
CAPCOM Copy that. That sounds like all of them to us.
SCHMITT Okay, and there are 2 on the cameras.
CAPCOM Roger.
CERNAN Bob, I read 670010701, 670010701.
CAPCOM Okay, copy that, we're ready for a bias, Gene.
CERNAN Okay. Bias, and it is flashing.
CAPCOM Roger, mark that.
SCHMITT Okay, let me take a look around.
CERNAN Jack.
SCHMITT Yes.
CERNAN Was that bag in there?
SCHMITT Yes, it's over here on the MESA.
CERNAN Okay.
SCHMITT Let's get rid of these 2 (garble) We don't
need those anymore.
CAPCOM That's affirm.
CERNAN You've come loose on the right.
SCHMITT Yes. Take a picture for you.
CAPCOM Let me know when they come off, don't get
them tangled up in the hoses. Stand still -
CERNAN Let me pull it off for you.
CAPCOM Stand still and let him untangle it.
CERNAN Okay, turn this way.
CERNAN Let's get the other side.
SCHMITT There, that's off.
CERNAN Came off, huh?
SCHMITT Yes.
CERNAN You don't have to get it around those
hoses and everything?
SCHMITT See if you can do it.
CAPCOM Works a lot better than the simulations
doesn't it?
CERNAN (Garbled) find the other one. Stand by.

CERNAN It's the only fallacy They're not even watching this.

SCHMITT Come on and watch me, Ed. Hold me.

Let me have it.

CERNAN Move over that way. He can't -

SCHMITT Did you see me?

CERNAN See if it comes off.

SCHMITT Nod your camera if you can see me.

CAPCOM Roger, we can see you.

CERNAN It's taking too long. Just take it off.

Is it off. (garble)

CAPCOM It is almost (garble)

CERNAN Jack, what - wait a minute before you -

Bob, are we going to need those other core tubes?

CAPCOM We'd like to have you leave 2 core tubes and the extension handle and the hammer and the core cap dispenser here. If we get back in time from doing all our appointed tasks at VIC site and at the ALSEP, we'll try and drive a double core here to end things up with a bang.

CERNAN Don't leave it there.

CERNAN We'll play games with the extension handle, but that's alright.

SCHMITT Okay, let me set them over here. Where am I?

CERNAN Okay, big bag, all those -

CAPCOM 17, did you guys leave your extension handles when that pallet came open?

CERNAN Yes, but we can - I can still drive a core with the hammer if we need to.

CAPCOM Okay, copy that.

CERNAN I think.

CERNAN Yes, one went with the ridge and one went with the scoop. Okay, Bob, as I read down that page it looks like we got it. The EPD check, I think we had 4 mags in there and a DSEA and the maps and the cosmic ray.

CAPCOM Roger. You've got 6 mags.

SCHMITT And I guess I'm ready to go to the -

wait a minute, I want you to do some -

CAPCOM Okay, one -

SCHMITT 6 mags is it?

CAPCOM One further question, did all the FSRs get off the Rover into the big bag?

SCHMITT That's affirm.

CERNAN Yes, this is a (garble) anyway, that's color.

SCHMITT I'll see if I can grab a couple.

Down right here.

CERNAN Boy are you dirty.
SCHMITT I know it.
SCHMITT Let's see, I don't know if I can get to
you.
SCHMITT (garble) you've got your camera in the
way.
CERNAN Oh, just take them straight on, that's
alright.
SCHMITT (garble) filters, okay.
CERNAN (Laughter) Such pose, let me get a little
different focus, that looks good. Golly.
SCHMITT One more over here. Have your pick.
CERNAN One more.
SCHMITT How do you like this?
CERNAN You got that camera, that's a color
camera, you take it.
SCHMITT Okay.
CERNAN I've got to go get a new neutron flux probe,
I guess.
SCHMITT Oh, yes. That's going to be easy to pull
out. Okay, let's see if I've got everything in here.
CERNAN You ready for me to go to the ALSEP, now?
CAPCOM Roger, we're ready for both of you guys,
now.
CERNAN Bob?
CAPCOM Roger, go ahead?
CERNAN Hello Houston.
CAPCOM Hello, 17. Standby I think we're having
a slight handover or something.
SCHMITT Houston, do you read? Gene, do you read
me?
CERNAN Yes, I read you.
CAPCOM Okay, 17. We had a slight bit of trouble
there and we've got you again.
CERNAN Are you ready for me to go to the ALSEP?
CAPCOM Roger, we're ready for both of you guys,
now.
SCHMITT What do you mean.
CERNAN I'm headed for the ALSEP.
CAPCOM Gene, are you ready for a (garble) of
the ALSEP, now?
SCHMITT Yes, he's gone, he's good.
CERNAN I'd better get out and go to the bip
site. Wait a minute, Jack, hey wait a minute. Where are
you?
SCHMITT Right over here.
CAPCOM We're trying to (garble)
CERNAN Come on back here a minute. Come on
back here a minute. I didn't realize you were going out
there quite so soon.

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SCHMITT I just looked to see where it is.
CERNAN What did you do with that - how about
this one?
SCHMITT You got it.

END OF TAPE

CERNAN (garble) one of my foot pan.
SCHMITT I put in the big bag.
CERNAN Okay. Here we go Jack. Here's one here.
SCHMITT Yes. Alright. Let me get it, so you won't
get it too dirty.
CERNAN Okay. Very good. Here hold it. Got it?
SCHMITT Yes. How about over here.
CERNAN I'll put it over here against that background.
CERNAN Houston, before we close out our EVA, we
understand that there are young people in Houston, today, who
have been effectively touring our country. Young people from
countries all ove the world, respectively touring our country,
They had the opportunity to watch the launch of Apollo 17. Hope
fully had an opportunity to meet some of our young people in our
country, and we'd like to say first of all, welcome and we hope
you enjoyed your stay. Second of all, I think, probably one of
the most significant things we can think about, when we think about
Apollo is that it has opened for us, for us being the Worlds a
challenge of the future. The door is now cracked, but the promise
of that future lies in the young people, not just in America, but
the young people all over the world. Learning to live and learn-
ing to work together. In order to remind all the peoples of the
World, in so many countries throughout the world, that this is
what we all are striving for in the future, Jack has picked up
a very significant rock, typical of what we have here in the valley
of Taurus Littrow. It's a rock composed of many fragments, of
many sizes, and many shapes, probably from all parts of the Moon,
perhaps billions of years old. But a rock of all sizes and shapes,
fragments of all sizes and shapes, and even colors that have grown
together to become a cohesive rock outlasting the nature of Space,
sort of living together in a very coherent, very peaceful manner.
When we return this rock or some of the others like to Houston,
we'd like to share a piece of this rock with so many of the coun-
tries throughout the world. We hope that this will be a symbol
of what our feelings are, what the feelings of the Apollo Program
are and a symbol of mankind that we can live in peace and harmony
in the future.

SCHMITT A portion of a rock will be sent to representative
agency or museum in each of the countries represented by the
young people in Houston today, and we hope that they will, that
rock and the students themselves will carry with them our good
wishes , not only for the New Year coming up, but also for them-
selves, their countries, and all mankind in the future. Put that
in the big bag, Geno. Big Bag.

CERNAN In the big bag. We salute you, promise of
the future.

CAPCOM Roger, Jack and Gene, we thank you for your
sentiments and your interests.

CERNAN And now, let me bring this camera around. To commemorate. Not just as Apollo 17's visit to the Valley of Taurus Littrow. But as everlasting commemoration of what the real meaning of Apollo is to the world. We'd like to uncover a plaque that has been on the leg of our spacecraft that we have climbed down many times over the last three days. I'll read what that plaque says to you. First of all, it has a picture of the World, Two pictures. One of the North America and one of South America. The other covers the other half of the World, including Africa, Asia, Europe, Australia, it covers the North Pole and the South Pole. In between these two hemispheres, we have a pictorial view of the Moon. A pictorial view of where all the Apollo landings have been made. So that when this plaque is seen again by others who come, they will know where it all started. The words are "Here man completed his first exploration of the Moon December 1972 A.D. May the spirit of peace in which we came be reflected in the lives of all mankind. It's signed Eugene A. Cernan, Ronald E. Evans, Harrison H. Schmitt, and most prominently Richard M. Nixon, President of the United States of America. This is our commemoration that will be here until someone like us, until some of you who are out there, who are the promise of the future, come back to read it again. And to further the exploration and the meaning of Apollo.

CAPCOM Roger, Gene. We, in Houston, copy that and echo your sentiments and Dr. Fletcher is here beside me. Like to say a word to the two of you.

FLETCHER Gene and Jack, I've been in close touch with the White House. And the President has been following closely your absolutely fascinating work up there. He'd like to wish you God's speed as you return to Earth and I'd like to personally second that. Congratulations. We'll see you in a few days. Over

CERNAN Thank you Dr. Fletcher. We appreciate your comments and we certainly appreciate those of the President. And whether it be civilian or military, I think Jack and I would both like to give our salute to America.

SCHMITT And, Dr. Fletcher, if I may, I'd like to remind everybody, I'm sure of something they're aware, but this valley, this valley of history has seen mankind complete it's first evolutionary steps into the Universe. Leaving the Planet Earth and going forward into the Universe. I think no more significant contribution has Apollo made to history. It's not often that you can foretell history, but I think we can in this case. And I think everybody ought to feel very proud of that fact. Thank you very much.

FLETCHER I'll see you in a little bit.

CERNAN Okay, babe, let's go to the (garble).

CERNAN Okay, Bob, I owe you a bias reading.

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CAPCOM Okay, we can get it later. There's no hurry
on that. And we're off at the ALSEP.

CERNAN I'm going to give it to you right now.

CAPCOM Okay. Ready to copy. I presume you been
UHT out at the ALSEP, Jack.

SCHMITT That's affirm.

CERNAN 337417101. 337417101.

CAPCOM Okay, copy that.

END OF TAPE

CERNAN Are you through with this?
 CAPCOM Roger.
 CERNAN Bob?
 CAPCOM Roger, we're through with it.
 CERNAN Be kind, be kind. Well, I love it, and I'm
 sure I did a good job -
 CAPCOM Well, we're not through with you, Gene, so
 don't throw yourself in the box.
 CERNAN No sir, I just don't want to hit old
 Challenger there. That was unkind. You did the javelin -
 that was unkind.
 CAPCOM Roger, Gene, at least -
 CERNAN I didn't throw it as far as I could. I
 just -
 CAPCOM We timed the parabola for that and have for
 one excellent measurement of g on the Moon now.
 CERNAN Yeah, I didn't get you a pendulum but I
 don't know where I would, Bob. Okay, I'm going to have to take
 you out to the VIP site -
 CAPCOM We're ready for that and we're -
 CERNAN - you concur?
 CAPCOM Okay.
 SCHMITT Well, let me make sure I got everything.
 Okay.
 PAO We won't have a picture while Gene Cernan
 drives the Rover to the VIP site, the very important place where
 the Rover will be left. He will turn the television back on
 after reaching that site.
 CERNAN Read me through the LM.
 CAPCOM Roger, read you through the LM. You guys
 both read me through the LM.
 (Playback) Read you through the LM. You guys both
 read me through the LM.
 CERNAN That's affirm. Okay, the first thing I want
 to do - tell John I'm going to do it exactly like he wants.
 SCHMITT Okay. The camera is under the seat, I hope.
 Let me look. Yeah, camera's there.
 CERNAN Jack, did you do something with the dust
 brush? It was under the seat, right?
 SCHMITT It was, yeah.
 CERNAN Yeah, I want to make sure it is because I'll
 need it -
 SCHMITT Oh wait a minute, I don't know that it's
 there now.
 CERNAN Well - I want to make sure I can get - get
 something to dust with.
 CAPCOM Okay, and Jack, as you go out to the ALSEP,
 let me tune in on your - (garble) about 3 hours worth of work
 out there preparing the ALSEP, alright? Over.
 SCHMITT Okay, go ahead, I'm here.
 CAPCOM Okay, number one, we want to retrieve the
 UHT and I quote tap sharply - that's sharply on the gimbal, which
 is the center section there with the little square metal piece
 in the middle. Tap sharply on the gimbal with the UHT and then

reverify the level on the LSG. We'll check response here in Mission Control after you've done that.

SCHMITT You mean tap on the thing that swings?

CAPCOM That's what they say.

SCHMITT You always wanted to do that, didn't you?

CAPCOM Yeah, that's right.

SCHMITT Well, let me see if I can grab a clean UHT to do that.

CERNAN Okay, Bob, everything is zeroed.

CAPCOM Okay, and I'll be talking to Jack here, Gene, for awhile. You can interrupt the ribbon on this over - talking over me and I'll try to copy him.

CERNAN One comment. I got a flag on the other battery - 139 degrees.

CAPCOM Okay, we copy that.

SCHMITT How much is sharply?

CAPCOM Sharply is sharply. It's probably not heavily but sharply. Fairly light, but sharply.

SCHMITT On the edge?

CAPCOM No, you see that little square metal piece - (garble) -

SCHMITT On the edge?

CAPCOM - you see that little square metal piece?

You can just sort of rap on that -

SCHMITT Oh, yeah. Okay, here goes. I did it.

CAPCOM Okay. And then it says -

SCHMITT You want me to do it again?

CAPCOM Stand by.

SCHMITT That was sort of a moderate hard tap.

CAPCOM Go ahead and hit it harder (garble)-

SCHMITT It is level.

CAPCOM Hit it harder, please.

SCHMITT Okay. Okay? I can hit it harder yet.

CAPCOM Okay, we've observed something there.

Stand by.

SCHMITT Bob, you might be getting TV the way the antenna's oriented right now.

CAPCOM Okay, Jack, go ahead. We'll do some more stuff here. In the meanwhile, while they're thinking about what's wrong with it, did you just tap it again?

SCHMITT No, I didn't touch it. I'm over at the central station now.

CAPCOM Okay, they're looking at it. Alright. Now, we want to take some photographs at the central station and a few selected - a few selected photographs of the ALSEP. Number one, we want a 7 foot cross-sun to the south of the ALSEP central station and then a 7 foot down-sun of the central station. Over.

SCHMITT A 7 foot cross-sun to the south.

CAPCOM That's what it says.

SCHMITT And then a down-sun.

CAPCOM Roger, a 7 foot down-sun.

SCHMITT You might tell me what they're trying to get with it. I might be able to help them.

CAPCOM Okay. I presume that what this means is looking to the south. It was cross-sun originally. I suspect that's what happened here, the way it was written up. So, it's a 7 foot looking at the - all the switches to make sure you guys turn them the right way, I suppose. And then a 7 foot looking down-sun, so that would be facing west, that side of it.

SCHMITT Okay, I got it. What else?

CAPCOM Okay. Now, there's a problem with the central station in which they think the south end is buried more deeply in the dirt than they had intended and the central station is, at the present time, getting very warm on the backside on the south side there which is - they believe you probably buried in the ground when you were trying to tilt it the proper alinement. They are requesting that when you're at the ALSEP you remove any soil buildup or debris with a convenient tool. They don't want you to touch it because it's fairly warm. But, if you have a UHT or something to move it - do you have a UHT with you or something with you that you can brush that soil aside with?

SCHMITT Yes sir.

CAPCOM Okay. You know the section -

SCHMITT It is piled up there - that's good (garble).

CAPCOM Yeah. Okay, they'd like that stuff brushed away. And you can give me a call -

SCHMITT Fortunately, I brought my handy-dandy Rover sampler out.

CAPCOM Okay, you can brush that aside and give me a call when you think that's cleared up the way it ought to be. That's probably one of those things we didn't think about when we decided to build the central station.

SCHMITT Well, you didn't - you couldn't anticipate the soil, Bob. Very soft.

CERNAN Bob, we are at VIP.

CAPCOM Okay, and Ed Bendel is hard on my back to remind you that it's better to be too far away than too close.

CERNAN Alright. I thought I was but I think I may move just a little bit. Here's a little rise here I can give you. I think I'll give it to you.

CAPCOM Okay.

SCHMITT By the way, Bob, the soil gets more cohesive with depth. I hadn't really noticed that before.

CAPCOM Okay, copy that.

SCHMITT It's quite a bit more cohesive at the - feels about the same down to 3 centimeters out here, and then the cohesiveness goes up so it's difficult to scrape with the Rover sampler.

CAPCOM Copy that, Jack.

END OF TAPE

CERNAN . Well, I think you can see almost every-
thing from here.

CAPCOM Okay, Geno. And Jack, let me know when you
get done scraping that soil away.

SCHMITT I will.

SCHMITT And, now comes the hardest alignment of
them all - but I can get it. Somewhere about there - see if
I can't tweak it up for you - Bob, the east-west level bubble
is not quite level. The north/south is. Do you want me to
tweak that up?

CAPCOM Yes, you might tweak that up. We're get-
ting a good signal but go ahead and tweak it up just a little
bit.

CAPCOM And, Gene, what are you doing these days?

CERNAN I'm getting the high gain set up for you.

CAPCOM Okay, now you know why we didn't make you
a partner in that orientation all the time, don't you?

SCHMITT Boy, I'll tell you that was a piece of
cake up until now.

SCHMITT There I got you.

CERNAN Bob, you're looking right down the center
of my eye teeth. You -

CAPCOM Okay, -

CERNAN You've got TV.

CAPCOM Yeah, we've gotten TV there Geno.

CERNAN You getting it?

CAPCOM We've got TV.

CERNAN Let me take a look and clean things up.

CAPCOM Okay, I guess you can dust, and dust and dust
some more for awhile.

CERNAN Let me get this dusting problem out of the
way before I do anything else.

CAPCOM Roger.

CERNAN You can look at your vantage point and
if you don't like it let me know.

CAPCOM Okay, I'll call Captain Video.

SCHMITT Bob -

CAPCOM Go -

SCHMITT How close can (garbled) be to the back
plate of the ALSEP?

CAPCOM Stand by, I'll check.

SCHMITT It's about 30 centimeters away most of
the places now.

CAPCOM Okay, that sounds good. We'd like to
return to the surface gravimeter, Jack. What you did had some
effect but not a lasting effect and we'd like you to rap even
more sharply, more strongly on the gimbal another
three times. And we're again watching it and we'll let you
know what to do. I'd like to tell you that this has all been
done recently, this afternoon, up at Bendix on the qual unit
and it survived it and so we are not in any real danger
apparently of destroying it.

SCHMITT Okay. Three times, huh?
 CAPCOM Rog, or up to three times.
 SCHMITT Bob, don't let me forget to bring a dust brush back when I come.
 CAPCOM Okay, I'll mark that down and remind you. And, Jack, you'll be glad to know that the temperature of the back plate there has already dropped 20 degrees.
 SCHMITT Oh, beautiful. Bob, I don't think that bubble is working. How's your signal now?
 CAPCOM Stand by and I'll check but why don't you to to the surface gravimeter?
 CERNAN Bob, how's your TV lens? I don't have a lens brush. It looks good from here. I don't want to use this unless you think so.
 CAPCOM Stand by.
 SCHMITT Rap three times.
 CAPCOM Roger, get out of the way please, Jack and we'll take a look against some bright soil.
 CERNAN What?
 SCHMITT No, that's me he's talking to.
 CAPCOM Okay, it looks pretty good, Gene. Go ahead.
 CERNAN I don't want to use the lens brush.
 CAPCOM Yeah, go ahead. It looks pretty good to us.
 CERNAN Okay.
 SCHMITT Okay, Bob. Here come the raps. About three times. Okay.
 CAPCOM Okay, Jack. That's really fighting it pretty hard. We'd like you to put the UHV in the socket and rock it very firmly, don't pick it up but rock it very firmly from side to side in all four directions - about move the UHV about 6 inches in each direction while you're doing it.
 SCHMITT Okay. - Okay, I rocked it. it's ringing.
 CAPCOM Okay, is it ringing?
 SCHMITT And the level bubble is better.
 CAPCOM Okay, we understand. It's in good configuration again as far as alignment and leveling is concerned, Jack. Let's go on and take some more ALSEP photos and let them think about it for a minute.
 SCHMITT Okay, what do you want?
 CAPCOM Okay. Next what we want is some Heat Flow - Okay, we just got late word they'd like to do it one more time and call it quits.
 SCHMITT The rocking bit, huh?
 CAPCOM Roger, the rocking bit one more time.
 CERNAN Bob, I may have moved the high gain. Do you see any change in signal?
 CAPCOM Stany by.
 CERNAN If you're happy, I won't touch it.
 SCHMITT Okay, Bob. It's rocked - the shadow - the shade is aligned to the sun now and it's level.

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CAPCOM Okay, we copy that and lets go get some
ALSEP photos, Jack. I think you got some heat flow photos the
other night besides the two pans. If you did, these may be
redundant. They're - they want the cross-sun and down-sun of
the east hole and cross-sun and down-sun of the west hole. And
I'm not sure whether you got those earlier. You said you got some
extra heat flow - but - tell me if you did. They're both -
all four of these are seven foot -

SCHMITT (garbled)

CAPCOM Go ahead.

END OF TAPE

CERNAN I'll get the heatflow pictures. They - one
was 11 foot I think. And then the stereo pair there -
CAPCOM Yeah, I think all they're asking for is the
two 7-foot stereo pairs.
SCHMITT Okay, that's one of them.
CAPCOM Okay, what they're asking for, Jack, is a
7 foot down-sun and a 7 foot cross-sun which isn't quite what we've
been thinking in the past.
SCHMITT I'm getting the standard ones, Bob.
CAPCOM Copy that.
SCHMITT Okay, you got the standard documentation.
CAPCOM Okay -
SCHMITT 11 footers and 7 foot stereos.
CAPCOM Okay, go ahead. They can't complain about
that certainly.
SCHMITT Okay, now what?
CAPCOM Okay, we'd like a 3 foot shot of the lunar
mass spectrometer including the orifice where the breakfield was.
And Geno we are observing some degregation and would like to have
the highgain -
SCHMITT Cross-Sun?
CAPCOM Yes, Jack, 3 foot cross-sun. And Gene, this
is Houston, we'd like to get the high gain reoriented a little
bit. We're observing some degregation in the picture.
CERNAN I'll tweak it. Okay, got it. Now what?
L and S is complete.
CAPCOM Okay copy that. Now we want to go over the
neutron flux, Jack.
SCHMITT Okay. How's the gravimeter doing?
CAPCOM We're looking at it, Jack. I'm not sure.
CERNAN Hey Bob, the panel you want covered - yeah,
that's the panel. Okay. You want the panel with the - with the
ON-OFF switch and the - and the signal switch and so forth covered
don't you?
CAPCOM Roger, and be sure to get the thing to external
before you cover it there, Gene.
CERNAN Okay, that was going to be a question of mine.
CAPCOM Okay, that goes to external.
CERNAN Okay, it's external.
SCHMITT What - what do you want me to do with the
neutron flux?
CAPCOM Okay, we want the photograph facing south,
for the 7 foot. So a 7 foot cross-sun essentially of the neutron
flux in the soil.
SCHMITT Okay. Would you like to have the RTG in that
picture?
CAPCOM No. I suppose if you're generous - - you might take a
partial pan around the RTG.

SCHMITT Well, it's just about in that direction.
Okay, now what?
CAPCOM Okay, now let's remove - remove the neutron probe, probe experiment, from the ground and turn it off.
CERNAN Okay.
SCHMITT No more on the gravimeter, huh?
CAPCOM No, the gravimeter is looking very bad still. And, Jack, you might notice when you withdraw (garbled) how difficult it is to withdraw it. Whether or not it's been seized by the soil collapsing around it or not. That's a soil mechanic study.
SCHMITT Not at all, not at all. It won't be I'll tell you. No problem.
CAPCOM Okay, we copy that.
CERNAN Okay, the high gain is - the high gain is tweaked.
CAPCOM Okay, we'll consider ourselves tweaked.
CERNAN And I'm giving the LCRU another zap here. Boy, I tell you, I ain't going to do much more dusting after I leave here. Ever.
SCHMITT Okay, upper probe is off. Mark it.
CAPCOM Copy that.
CERNAN Okay, Bob. I'm going to put B and D OPEN and OFF circuit breaker bypass ON.
CAPCOM Okay, copy that.
SCHMITT And let me see -Bravo, Okay, and Delta, okay, Bravo and Delta upper probe is OFF. Mark it.
CAPCOM Is that upper or lower, Jack?
SCHMITT Up. Oh, lower, I'm sorry, Bob.
CAPCOM Copy that.
SCHMITT Power circuit breaker is ON, bypass ON. And the lower probe is capped -
CAPCOM Okay, and Gene you need to close that caution and warning flag. It's a heat thing when it's open I guess.
CERNAN Okay, it's closed.
CAPCOM Copy that.
CERNAN You want me to put a bag in front of that thing?
CAPCOM No, I don't think -
CERNAN Want me to put a bag in front of it in case it pops open again? I guess it won't.
CAPCOM No. I don't think so. I can't imagine why it's really a problem anyway because we got the bypass on there and that heat's not going anywhere.
SCHMITT Okay, now the switch is OFF. Except my 15 volts. Bob, you want me away from the ALSEP now?
CAPCOM Stand by, Jack. I'll get one more word there before we come back to the LM.

CERNAN Okay. Yeah, I got a camera, over there. -
I'm going to look under the seats one more time. Nothing but
a 500 -okay. Used tape -

CAPCOM Okay. Jack, we're ready to leave the ALSEP.

SCHMITT Well, I hate to do that, Bob. I'm sorry
about this gravimeter though.

CAPCOM Well, you're not the only one. The word is
down here there's a whole room full of people that are sorry.

PAO EVA time 6 hours 46 minutes.

CERNAN Okay, I got the LMP's camera, nothing in here,
but couple of little bags, we used about all the bags we had,
Jack. Not many here. Bob, I have the dust brush covered.

CAPCOM Copy the dust brush.

CERNAN Okay, let me get one parting shot - one of
the finest running little machines I've ever had the pleasure
to drive.

END OF TAPE

CAPCOM Okay, Geno, some people down here are concerned about whether you've opened the battery covers or not.

CERNAN Yes sir, they're open.

CAPCOM Roger, copy that.

CERNAN Ah, what a nice little machine. Parked on a little down slope, we've got the heading you want and I guess Ed's satisfied with the TV response, huh.

CAPCOM Roger, we're satisfied with the TV, Gene. We're ready for you to take the EP number 3.

CERNAN Good old Mother Earth is right smack in the center. Bob, while we've got a quite moment here, as I go to deploy that EP charge, I'd just like to say that any part of Apollo 17 or any part of Apollo that has been a success thus far, is probably, for the most part, due to the thousands of people in the aerospace industry who have given a great deal besides dedication and besides effort and besides professionalism to make it all a reality and I would just like to thank them, because what we've done here and what has been done in the past, as a matter of fact, what has been done for 2 hundred years, you've got to contribute to the spirit of a group of people who form the aerospace industry. And I God bless you and thank you.

CAPCOM Roger, Gene, and we thank you guys.

CERNAN Ah, we're just 2 little - 2 little sets of twinkle toes here, there's a lot to getting this Rover running out here that we don't have much to do with. Yeah, I guess there might be someone else that has something to do with it too, and I've been reading His signs, maybe not from Him directly, but His in Spirit, as we run up and down that ladder and that's God's speed, the crew of Apollo 17, and these listed, I'd like to thank Him too. 10 1 is pulled.

CAPCOM Mark that.

CERNAN I meant the end of the Wolf step antenna, do you agree with that.

CAPCOM Roger, exactly right.

CERNAN Okay, 10 2 is pulled. Still stayed 10 3 is pulled and it still staged.

CAPCOM Copy that and -

CERNAN Don't know what I would do if it wasn't (laughter).

CAPCOM And now, also, do you have the SEP transmitter turned OFF there, Gene?

CERNAN No sir. Thank you - Okay, Bob -

CAPCOM Then we're ready for you guys to get back to the LM and dust it -

CERNAN - it's getting ready - it's getting ready Jacob to the ring, on the west end and I'm going to go back and turn the SEP off.

CAPCOM Okay, and when that's done, Gene, we're ready for you and your dust brush to ease on back to the LM and dust each other and climb in.

CERNAN You know what, Bob.
CAPCOM What, Gene.
CERNAN (garble) as the experience has been,
I'd say we're probably both ready.
SCHMITT Oh, I don't know. Hey, Bob, 55 Yankee
is an exotic looking rock I found about 5 meters south of
the neutron flux hole, it's another grey, possible grey
basalt, it's just that there aren't many of them around
here and so I picked it up.
CAPCOM Copy that.
SCHMITT Cheating a little again.
CERNAN Jack, you'll always be picking rocks.
SCHMITT Oh, I don't know.
CERNAN Okay, the transmitter is OFF.
CAPCOM Mark that.
CERNAN I don't blame you, there's so many
interesting thing around here.
SCHMITT Just don't lose your brush, Gene.
CERNAN Okay, Bob, according to my inventory
I'm going to return to the LM and the camera is going to
the ETB.
CAPCOM That's affirm. We'll have -
CERNAN And we're done with the TGE.
CAPCOM Roger.
SCHMITT We need a bias reading we want to use
it again, Gene.
CERNAN Yeah, come to think of it, I - come
to think of it, I guess you are aren't you.
CERNAN Where are you, Jack?
SCHMITT I'm at the MESA.
CERNAN Okay.
SCHMITT Trying to snap a snap.
CERNAN I need a locator here to the LM.
CAPCOM Okay, and 17, we need you guys in the
LM in one 5 minutes 15 minutes because of oxygen constraints.
SCHMITT Okay, Bob, my pictures are taken, I'm
on the way. Oh, boy, where else could you do this.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/13/72 GET 170:29 CST 2322 MC 695/1

CERNAN If that had landed 30 meters back, Jack, we'd be pitched down 5 degrees.

SCHMITT Right.

CERNAN Okay, what you're saying is I don't need my hammer any more.

CAPCOM Roger, we want you to dust and get in. We got one four minutes remaining before we need the hatch closed.

CERNAN Okay, Bob, we'll - we're doing our best. Well (garble) on the hammer, but look at it, Jack. It's worn completely to a nub. It's off.

SCHMITT I guess that's alright - Look at - Here - my - I don't know where I am. Oh, boy, how about that? Okay.

CERNAN Okay, sir, you ready go on up?

SCHMITT Well, I will get this camera on. I got another batch of pictures - the LM and the flag.

CERNAN Well, watch this real quick -

SCHMITT Stereo, even.

CERNAN Jack -

SCHMITT Let me have your camera. Go ahead.

CERNAN Oh yeah, pull it away. Let me throw the hammer. Okay? Let me throw the hammer - please.

CERNAN It's all yours - you've got the - you deserve it -

CERNAN A hammer thrower - you're a geologist. You ought to be able to throw it. You ready? You ready for this? Ready for this?

CERNAN Yeah. Don't hit the LM or the ALSEP.

SCHMITT Look at that, look at that, look at that.

CERNAN Beautiful.

SCHMITT Look like it was going a million miles, but it really didn't.

CERNAN Didn't it? Okay, here, this is an ETB.

SCHMITT Let me - let me make sure that that's all cinched up.

CERNAN Okay. And then start on up. We got to get going here.

SCHMITT Unfortunately, their little plan didn't count for the fact that it's hard to pack the ETB with the film magazines in it.

CERNAN And I'll try and get the big bag here cinched up.

SCHMITT That is a major task.

CERNAN Yeah, that's going to be - oh, is it heavy. Is it heavy. Something in that core tube you put in there?

SCHMITT Yes sir. Don't tell anybody though because they'll get mad at me.

CERNAN Oh, man, is that heavy. Holy smoly.

SCHMITT 252. That's about three quarters of a core, hand pushed half a meter inside the +Y footpad.

CAPCOM Okay, copy that. Copy that.
CERNAN Okay, Jack, how's that ETB coming so we
can get going?
SCHMITT Fine. I've got to put it on a strap, though.
CERNAN I can get that. This is all cinched up. I
think it'll hold.
SCHMITT Why don't you start on up and I'll start
dusting you.
CERNAN Okay.
SCHMITT Okay.
CERNAN Very good. Anything fall out?
SCHMITT Nope.
CERNAN Okay.
SCHMITT Let me dust you - set that down and I'll
(garble)
CERNAN You'll have to hand stuff in -
CAPCOM Okay, and 17, - a reminder we need you
inside in 10 minutes.
CERNAN Okay, Bob.
PAO EVA time 7 hours.
SCHMITT I'm going to do a lot of jumping. I'll be
there in a minute.
CERNAN (garble) back. It's clean.
SCHMITT I'll get the legs as best I can.
CERNAN I want you to get me here before you do
that.
SCHMITT Okay. And while I'm doing that, will you
(garble) okay?
CERNAN Okay.
SCHMITT Boy, you got dirty today. I think we're
just going to have to live with it.
CERNAN Get my top. I can kick a lot of that stuff
off my legs. How do I look in back?
SCHMITT Terrible. You're going to have to - your
legs are really filthy. Not much I can do about it.
CERNAN Okay, I'll get them off. Why don't you
start packing -
SCHMITT Kick them against each other and it will
come off.
CERNAN Okay. Put it on up.
SCHMITT You might shake the bag.
CERNAN Okay.
CAPCOM And don't forget your equipment.
SCHMITT Nope.
CERNAN Do what?
SCHMITT First antenna.
CAPCOM Hello.
SCHMITT Doesn't make much difference any more.
Have to get them out of the way. The big bag didn't stay closed
very long.

SCHMITT I don't know how we can get that in.
CERNAN There, I'll stand - I can hand it to you.
SCHMITT It never had a very good closure on it, but
it can be closed.
CERNAN I had it over - over the top. The latch
was closed -
SCHMITT Ah, it won't hold with all that weight in
there.
CERNAN Okay, I got your antenna. Let me get a
high -
SCHMITT Got to close this - you don't want
that in your way.
CERNAN I can't close it.
SCHMITT Oh, okay.
CERNAN You might try.
SCHMITT Get all your flaps? Okay, hold your head
down.
CERNAN Yow.
SCHMITT Won't go, huh?
CERNAN Nope. Will that bother you getting in?
SCHMITT I can probably make it.
CERNAN Get on up.
SCHMITT Oops, try that again. Okay, why don't you
hand me the neutron flux and I'll put it -
CERNAN Okay, neutron flux.
SCHMITT - on the platform. Okay.
CERNAN Why don't you start on in and I'll get some
of these bags out of the way?
CERNAN Well, I just - you don't want to hand them
to me up here?
SCHMITT Okay.
CAPCOM And Jack, for your thoughts, we've agreed
that you can delete the tracking light. We'd like to get you
guys in as soon as possible, 7 minutes now, and we'll delete
the tracking light test.
SCHMITT Okay. Okay.
CERNAN Okay, that's all I can handle up here. One
more and I can put it up here. Watch the cover on this one.
SCHMITT Got it?
CERNAN Got it. Stand it up because the cover won't
hack it.
SCHMITT Okay.
CERNAN If you get on in, I'll come up to the porch.
SCHMITT Where's that EVA pallet that's always in
my way?
CAPCOM I don't think we're going to have one of
those tomorrow, Jack, so we did away with that. We hope we're
not going to have one of those tomorrow.
CERNAN Bob, we're maximizing our efforts so just
bear with us. Jack's going to be in about 30 seconds and I'm
on the ladder. I'll lift myself up now.

END OF TAPE

CAPCOM Ah- Roger. Don't panic.
CAPCOM Well, we're not. I just don't want you to.
CAPCOM I never (garbled) -
CERNAN Got some stuff for me?
SCHMITT Yes sir.
CERNAN It's not the time to rush. It's the time
to do it nice and slow and right.
SCHMITT Okay.
CERNAN You're not going to like this but I'm
going to give you this one first cause I've got it in my hand.
SCHMITT Either one. - Oh, hang in there - I've
got it. Yeah, that's a heavy bag.
CERNAN That is heavy, babe. Let me tell you,
that's heavy.
SCHMITT Okay, next?
CERNAN Can you reach that one?
SCHMITT If until I'll shove it in further. Okay.
CERNAN One more coming at you.
SCHMITT Okay.
CERNAN Tilting up right now.
SCHMITT Go ahead. - Okay, next.
CERNAN Okay, tilting up at you.
SCHMITT Got it.
CERNAN Okay.
SCHMITT Okay, next. Okay, Bob, we've got it.
Up here - big bag, 3 SRC's and the Neutron Flux.
CAPCOM Okay, and we gather an ETB's coming up.
with 2 cameras in it.
SCHMITT ETB's next.
CERNAN You have an ETB in.
SCHMITT ETB has 2 cameras.
CAPCOM Okay, you guys say farewell to the Moon.
We're looking up from the Earth down here where you guys will
be returning pretty soon.
SCHMITT Okay, you're going to have to push that.
CERNAN Okay, let me get it.
SCHMITT That's all right - I'll wait until you're
ready.
CERNAN Okay. Can you make it?
SCHMITT Yeah, I've got it. Okay, let me get this
other thing in down here.
CERNAN Bob, this is Gene and I'm on the surface
and as I take these last steps from the surface, back home, for
some time to come but we believe not too long into the future,
I'd like to just list what I believe history will record that
America's challenge of today has forged man's destiny of to-
morrow. And, as we leave the Moon at Taurus-Littrow, we leave
as we came, and God willing, as we shall return with peace
and hope for all mankind. Godspeed the crew of Apollo 17.
CAPCOM Roger, Geno. Thank you very much.
CERNAN Bob, I am up on the ladder and I'm going
to be going through the hatch.
SCHMITT Gene, I've got to get out of your way.

SCHMITT Okay.
CERNAN Okay, let me - Okay, babe - here I come.
SCHMITT Come on in.
CERNAN Hatch look good to you?
SCHMITT Well, it looks dirty. Okay, keep her down -
buttoned. Come towards me a little - there you go. Okay, you've
got it.
CERNAN Okay, I'm inside the hatch.
SCHMITT Okay.
CERNAN Let me look - let me see that hatch once
more. That's the last time we want to have to open that.
SCHMITT Caught in the same way again.
SCHMITT I can see down there.
SCHMITT I can see -
CERNAN Does it look good to you?
SCHMITT It's clear - there is a little bit of
dust but it's all in the - I don't think (garbled)
CERNAN Roger.
SCHMITT There you go.
CERNAN Are you going to turn around?
SCHMITT Yeah, I've got to get out of your way.
CERNAN I'll wait for you.

END OF TAPE

SCHMITT There you go.
CERNAN Do you have to turn around?
SCHMITT Yeah, I've got to get out of your way.
CERNAN I'll wait for you.
SCHMITT Yeah, now I can.
CERNAN Okay.
SCHMITT Okay, I've got to get my hand over here,
okay, I'm out of your way.
CERNAN Okay. - And - hatch is closed. Let's
see if I can lock it.
SCHMITT Then we've got to turn our H2O off. Oh,
we've got to turn our - let's turn our water off first, before
you lock it.
CERNAN Well, it's locked now. Can you get your
own water?
SCHMITT Yeah, I've got it. Haven't been able to
before.
CERNAN Okay, I'll get it.
SCHMITT Have you got yours? Let me see.
CERNAN Mine's off.
SCHMITT Oh, I can't get it.
CERNAN Okay. I'll get it for you. And - before
you move any more let me get over here out of the way.
CAPCOM Okay, and pay attention here 17, when you
come on we'd like you to leave PLSS rate A which is the one
that's in OFF - we'd like to leave that closed.
CERNAN Turn around.
CAPCOM Just use PLSS rate B.
CERNAN Okay, Bob.
SCHMITT Get it Gene?
CERNAN Turn some more. I can almost reach it.
SCHMITT Gene, your aux water is off.
CERNAN Okay. Okay, Bob -
SCHMITT No, no. The prime water. Okay.
SCHMITT Your prime water is off.
CERNAN Is your prime off?
SCHMITT Yep. It's off.
CERNAN Okay. Prime water closed. Port
hatch closed and locked. Okay, I've got to get the upper
valve, Jack. Move in.
SCHMITT Okay.
CERNAN How's that?
SCHMITT Oh, that ought to do it.
CERNAN Auto and I've got the lock on it. Now,
Bob, say again which reg you want closed.

SCHMITT Reg A left closed for data.
CAPCOM That's affirmed, Jack.
SCHMITT Go ahead.
CERNAN Okay, dumb valves both auto - can repress
auto.
SCHMITT Cabin repress auto.
CERNAN Okay, and I've got plenty of oxygen so
we're in good shape for an auto repress. Cabin repress
breaker closed at 16.
SCHMITT Cabin repress closed.
CERNAN Come on baby, there it comes. Half a psi.
CERNAN Okay, it is - it is increasing - go to
cabin on the regulator.
SCHMITT Reg B.
CERNAN Yeah, just the one regulator B. 1.5
SCHMITT Reg B in the cabin.
CERNAN Okay, she's coming up. There's 2.0
Your next move will be to get PLSS O2 off. 3.5. Okay, get
your PLSS O2 off.
SCHMITT Mine's off?
CERNAN Can you get it?
SCHMITT (garble) shortly.
CERNAN Turn around - I'll get it for you.
SCHMITT I think that I've got it. There I got it.
CERNAN Okay.
CERNAN Verify cabin pressure stabilized at 4.6
to 5.0. You watching it?
SCHMITT I'm watching. 5.
PAO EVA ended at 170 hours 48 minutes 8 seconds.
EVA duration 7 hours 15 minutes 31 seconds.
CERNAN You don't need to take a deep breath (garbled)
SCHMITT Oh, yeah.
CERNAN Verify your circuit breakers - lights out -
(garbled) EVA decal.
SCHMITT Oh, my God. Okay, I'm squared away there.
CERNAN Squared away?
SCHMITT Damn right.
CERNAN Okay
SCHMITT Looks good.
CERNAN Stay at 16 now ECS closed.
SCHMITT (garbled) closed.
CERNAN (garbled) LP closed.
SCHMITT Closed.
CERNAN Caution lights are on, that's good. Tell the
SEP.
SCHMITT ECS in Caution don't go out. Doff gloves.
CERNAN Oh, oh. Sweet music to my ears.
SCHMITT Have to put them on again in a few minutes.
CERNAN I know, it's still sweet music to my ears.
SCHMITT Come on now.
CERNAN I have never seen so much dirt and dust
in my whole life. Ever. Ron's not to see out of either one
of these helmet visors.

APOLLO 17 MISSION COMMENTARY 12/12/72 23:38CST 170:45GET MC697/3

SCHMITT (laughter) Yes he will.
CERNAN But they sure do get scratched if you're not careful. Okay.
SCHMITT It's harder getting them off than it is getting them on. Ah, I did it. Patience - actual method. Okay, help - my gloves are off.
CERNAN Right sir.
SCHMITT Okay, verify safety on the dump valve.
CERNAN Okay, I verify that. Just a minute, I want to take a double look at something down there.
SCHMITT What's that? Rocks?
CERNAN Um-hum. Schmitt heavy?
CERNAN Yeah.
SCHMITT Okay, descent H2O valve open.
CERNAN Okay, descent H2O valve open.
SCHMITT Open.
CERNAN Remove (garbled) store first.
SCHMITT Okay.
CERNAN Disconnect OPS hose.

END OF TAPE

SCHMITT Oh boy.
CERNAN That lock is just tight on there, Jack.
SCHMITT It is. Got it.
CERNAN Is it off.
SCHMITT Yeah.
CERNAN Okay. Connect LM hoses, red to red,
blue to blue. We've got to do that this time because we've
got to dump the PLSS's.
CERNAN Okay.
SCHMITT Okay. Let me turn around here. Let me
get out of your way.
CERNAN I'll get back in here.
SCHMITT Okay, I'm out of the way now.
SCHMITT How would you like to get off the PLSS water
and get some spacecraft water, too.
CERNAN Oh, that's the next thing. (garble)
iso (garble) on and then we'll put PLSS pocket fan off.
Then we'll disconnect the PLSS water and connect spacecraft
water.
SCHMITT You might unhook that stuff up there so
you can get to your hoses.
CERNAN I can't reach it though.
SCHMITT Oh, Okay. I can get it best. I
can get it.
SCHMITT Okay, I guess.
SCHMITT Okay, we want red to red and blue to
blue.
SCHMITT We got to verify these two because -
CERNAN Yeah.
CERNAN Bob, you still with us?
CAPCOM You bet, I wouldn't leave for the world.
CERNAN Okay.
SCHMITT Okay, I'm hooked up and locked.
CERNAN Okay.
SCHMITT You want to verify? And I'll veri - do it
for you, if you want.
CERNAN Okay, see if you can't find this one.
SCHMITT Yeah, yeah.
SCHMITT We're verifying the red one.
CERNAN Okay.
CERNAN In and locked?
SCHMITT Got the red one locked.
SCHMITT Locked.
CERNAN Okay.
SCHMITT Let me take a look at yours.
CERNAN Locked.

CERNAN Locked.
 SCHMITT Okay.
 CERNAN Okay, now -
 SCHMITT Ready for suit flow?
 CERNAN Yes sir, suit flow on both of them.
 CERNAN Okay. Oh man, it feels great.
 SCHMITT Yes sir.
 CERNAN PLSS pump OFF and PLSS fan OFF.
 SCHMITT PLSS fan is OFF. Pump's OFF.
 CERNAN Okay, disconnect PLSS water from PGA.
 Back to LM water. Boy, I never thought air could feel so cool.
 CHALLENGER Yeah.
 CHALLENGER Okay, the PLSS water is disconnected.
 CHALLENGER I think that's mine.
 CHALLENGER Yeah, that's mine. Spacecraft water.
 CHALLENGER Okay, mine's connected.
 CHALLENGER How about pushing on that?
 CHALLENGER Okay.
 CHALLENGER Got to see it. Yeah, but I want to see it first.
 CHALLENGER Watch your helmet, Jack, you're scratching it.
 CHALLENGER Got it - yeah got it. You don't have your visors on - neither do I.
 CHALLENGER Okay, connect - Okay, PLSS mode on. Oh, Bob, we're both going off the air. We'll get on LM COMM.
 CAPCOM Okay, we'll be waiting for you. We're here.
 CHALLENGER Okay, go 0, Jack.
 CHALLENGER How about some cooling?
 CHALLENGER Okay, zap me with it. Go 0, and then put your audio breaker OPEN and connect the LM COMM. Then an audio breaker closed. Okay?
 CHALLENGER You read me, Jack?
 CHALLENGER You read me?
 CHALLENGER Read me?
 CHALLENGER Loud and clear.
 CHALLENGER Okay. Next thing, VHFB - wait a minute. You get the audio breaker open, closed, - Okay - VHF squelch B LMP. Okay, noise threshold, plus 1 1/2.
 CHALLENGER Yeah.
 CHALLENGER Okay, AUDIO, both panels. VHF will be - a RECEIVE and B OFF.
 CHALLENGER A RECEIVE and B is OFF here. Okay, mode ICF PTT.

APOLLO 17 MISSION COMMENTARY 12/13/72 23:45 CST 170:53 GET MC698/3

PAO This is Apollo Control at 171 hours. Ron Evans, in America, 3 1/2 minutes away from loss of signal on the forty second lunar revolution. Ron, in good shape, and all systems on America functioning well. SIM bay experiments performing well, also. Even though we'll be in contact for another 3 minutes we have said good night to Ron and he, shortly, will be getting a - an 8 hour shift sleep.

CHALLENGER Okay, Houston, we're back on LM COMM.
CAPCOM Roger, 17, we copy you loud and clear
on LM COMM.

PAO This is Apollo Control at 171 hours 1 minute. The 3 EVA's of Apollo 17 totaled - (garble) 17 at 2 of them. One of the longest single EVA's - 7 hours 37 minutes and 22 seconds. Longest total lunar surface EVA time 22 hours 5 minutes and 6 seconds. And the summary, the total lunar surface EVA time for the Apollo program - 80 hours 44 minutes and 8 seconds.

CHALLENGER That's quite a tribute to the people who made it possible, I'll tell you. Thank you, Bob.

CAPCOM Roger, Geno, and I can't speak as authoritatively as some people have tonight but -

END OF TAPE

APOLLO 17 MISSION COMMENTARY, 12/14/72, 23:55CST 17102GET 699/1

CAPCOM Roger, Geno. And I can't speak as authoritatively as some people have tonight, but for all of us around me I'll say thank you also.

CERNAN Your words are well taken.

SCHMITT You know how I feel.

CAPCOM Hey, Gene and Ron, this is the CSM CAPCOM. Thought you might be interested your buddie up above you there is chugging around and about ready to bed down himself right now and he did take a good look at the landing site through binoculars tonight and took a good look at Shorty crater there and noticed quite a lot of variations in color - that may be the same color changes you saw in that orange soil and that but we're trying to match it all up in Farouk and Ron are working it out. We're trying to match it all up and see if we can get a comparison there.

CERNAN Excellent. Tell him we'll see him tomorrow.

CAPCOM Yeah, he's counting on it.

CERNAN How's American looking to you, Bob?

CAPCOM I'll give an update. It's working perfect. No problems at all and we got good SIM bay data on everything. The UV, the IR the lunar sounder and everything that we - every data point that you see is just great. It's - it's just hardly any anomalies at all. Everything is just wonderful.

CERNAN Outstanding.

CAPCOM Gene about this total limit of any problem there is and it's not a problem is we're just having to stir those H2 tanks manually because of that limiting cycle on the pressure switch there. We could go back to auto but it's easier to go manual.

CERNAN I'll be back up there tomorrow and I'll stir them for you.

CAPCOM Roger.

CAPCOM And Jack and Gene, let me make a note here for you guys. There will be a series of references to this around the checklist but it's a general thing and you might even put a piece of tape across it if you want to or something - rather than go through and call at all the locations. We'll leave press REG A closed for the rest of the time. Might keep that in mind.

CERNAN Okay, Bob, we'll - I think we'll handle that one okay.

CAPCOM Gene, one thing you may be interested in as the commander. We're going to have to do two burns tomorrow on America. The orbit - the mascons didn't deteriorate the orbit as much as everybody thought it was so there's going to be and RCS burn about an hour prior to the - to the LOPC burn.

CERNAN That's interesting, Bob. Are you going to do DOI 3, huh?

CAPCOM Well, yeah, I guess that's what it'll be - it's going to be an RCS burn at about 11 foot per second it'll drop the - it'll circularize the orbit and then we'll do the plane change burn.

APOLLO 17 MISSION COMMENTARY 12/14/72 23:55CST 171:02GET 699/2

CAPCOM Okay, and 17 we'd like you to press on reasonably diligently tonight. You're just about on schedule but if we can turn off this Marine we'd like you guys to press on. We're looking at a nominal launch time and we've used up, of course, all the MCC-H conference but we think you're within a few minutes of being right on. If you can press on like you did last night we'll be in great shape.

CERNAN Okay, Bob. I never stopped doing what I wanted to do anyway even though a Marine was talking. Okay, CDR's OPS 6100, LMP, 6500.

SCHMITT Okay, Houston this is the LMP. LMP's OPS is regulating at 4.25.

CAPCOM Okay, copy that.

SCHMITT And the CDR's is 3.9. 3.9.

CAPCOM Okay that.

SCHMITT That might be - I started - let me bring it off and let me see where to regulate that next time. I didn't have my hose locked, Bob and it came off the first try. Bob we'll take another OPS check later on when we stow them. We're pressing on.

CAPCOM Jack, they're saying we better do that before you throw out the PLSSes because we have to verify a good one for you before you dump the PLSSes.

SCHMITT Okay, we'll do that.

END OF TAPE

SCHMITT Okay, Houston, we rechecked the LMP's OPS
and it's regulating at 4.25 again.
CAPCOM Is that a steady 4.25 Jack?
SCHMITT Yeah, it's done that twice now.
CAPCOM Okay, and it's steady once you do it, Jack,
right?
SCHMITT Right, it's open now, we've been watching
it for about a minute, now.
CAPCOM Okay, we'll go with it then Jack.
SCHMITT Okay.
SCHMITT Okay, Bob, we're going to start the weighing
process here -
CAPCOM Okay we're ready to copy -
SCHMITT - might take a couple minutes to get things
squared away.
CAPCOM Okay give us a call, we're ready to copy
the weights.
SCHMITT Okay.
SCHMITT Bob, sample 15 Echo has a bunch of dust
and (garble) accumulated in my pocket.
CAPCOM No fair, Jack, you can't go collecting
samples after the EVA's over.
SCHMITT Say - say Bob, right now I can't find
the sample containment bag number 5. Number 5 collection
bag will be in bag 3.
CAPCOM Okay, we note that thank you; very good.
SCHMITT Okay, and we're going to cross out 3 on
the bag, and put a 5 on it.
CAPCOM Okay, I think we could keep track of it
otherwise, but that's fine.
SCHMITT That's for our reference too.

END OF TAPE

CHALLENGER Okay, Bob, you ready?
CAPCOM Roger, we're ready.
CHALLENGER Okay, bag 7 is 32, bag 4 is 31.5, bag 5
is 21, the big bag is 71, the ISA is 22.
CAPCOM Okay, we have those 5 weights there, Geno.
We have 32 for number 7, 31.5 for number 4, 21 for number 5,
71 for the SR - big bag and 22 for the ISA.
CHALLENGER That's affirm, and we're standing by for
your GO for jettison.
CAPCOM Okay 17, Challenger, we are ready for
jettison.
CHALLENGER Roger, understand.
CAPCOM Okay and 17, we'd like -
CHALLENGER How do you read, Bob?
CAPCOM - loud and clear, 17. And Challenger, we'd
like to keep out the original (garble) bag, the one that you
launched with. We think we're going to need that to stow
samples in.
CHALLENGER Okay, it's out.
CAPCOM Okay, or (garble)
CHALLENGER Okay.
CHALLENGER Recorder on.
CHALLENGER Whichever way.
CAPCOM We want it kept in the cabin, right.
CHALLENGER Recorder's on.
CHALLENGER Okay, don EV gloves.
CHALLENGER Okay, the recorder's not giving us any
recording though. See if I can't get a little debris shook
out of some of these things.
CHALLENGER Don your gloves, Jack.
CHALLENGER Why isn't the recording recording?
CHALLENGER Are we out of tape?
CHALLENGER Do you know or not?
CHALLENGER I don't think I left it on.
CHALLENGER I might have left it on. I probably did
if it's on now. I thought I read it in the checklist though.
Don Arabian will never forgive me.
CAPCOM Shall we save ourselves some ascent weight.
CHALLENGER (laughter)
CAPCOM Unfortunately, Owen wasn't listening.
CHALLENGER Well it was okay up until - it was just
this EVA if it was on Bob.
CAPCOM Okay.
CHALLENGER Because it was working when we prepped, I'm
sure of that.
CHALLENGER Okay, did you don your EV gloves?
CHALLENGER And we'll check each others connectors
again. I'll take my cuff checklist off.
CHALLENGER Needless to say, you don't have to put
your dust covers on, Jack. See if that makes you feel better.
CHALLENGER Oh boy.

CHALLENGER How long were we out today, 7-1?
CAPCOM Stand by, we got it here someplace; 7 hours
and - 7 hours 15 minutes and 31 seconds.
CHALLENGER How many kilometers did we put on the rover.
CAPCOM We have an approximate total of about 36.1.
CHALLENGER Boy this one is really getting stiff.
CHALLENGER Probably another 1/2 kilometer on that when
the NAV wasn't working.
CAPCOM I don't - yeah we didn't - we didn't get
distance readouts all the time. We sort of interpolated those
distances there, Gene.
CHALLENGER Push on the button.
CHALLENGER Are you opening or closing.
CHALLENGER Closing, trying to.
CHALLENGER You don't have to push on the button to
close it.
CHALLENGER Well yeah -
CHALLENGER It's not locked.
PAO That rover mileage is straight line distance.
There would be a 10 to 20 percent variable factor for skirting
around craters and other excursions of that type. The experi-
ments support room expects to have a better one on the mileage sometime
tomorrow.
CHALLENGER Check.
CHALLENGER This thing down here started -
CHALLENGER Wait a minute, tangled.
CHALLENGER Okay. After this I don't want -
CHALLENGER All we need. Okay. Good.
CHALLENGER (garble).
CHALLENGER Okay, EV gloves are donned. Let's check our
PJ connectors, do you want to check mine?
CHALLENGER That's locked, that's locked, okay. Helmet
(garble) changed. Okay. That's locked, locked, locked, locked,
over, I can't see, locked. Okay, suit circuits shall not be
maintained at elevated pressure greater than 5 minutes. Okay,
we want to do an integrity check, here. Now we're not going to use
reg A at all. Right. Okay (garble) converter full egress verify. Full
egress. (garble) can verify all that other stuff. Cabin gas
return egress, verify. Verified. And 2 circuit release is a
CLOSE. Close it. Okay it's going CLOSED. CLOSED. Okay, pressure
reg, A, let's leave A OFF, and pressure reg B to direct 02
(garble) 40, and then go to egress, and we'll check our decay.
Okay, go on to - Wait a minute I think I should have went on to
(garble) yeah. Okay, it's unlocked. Okay. Three ready for 2
Check. How high do they want suit. 37 to 40 cup gage. Okay.
It's warming up slowly. Yeah, it's getting somewhat warmer.
Off the peg, bat off the peg. Okay, coming up on 35 okay,
when you hit 37, I'll be with you so you can - Okay 37. Okay
MARK it 1 minute. Okay. You did go egress, right? Yep. Okay.
CHALLENGER (garble) Well it's supposed to be possible
to do this. Hope so, we'll freeze.

END OF TAPE

CHALLENGER Well, it's suppose to be possible to do.
CHALLENGER Hope so, breath.
CHALLENGER There.
CHALLENGER Get it.
CHALLENGER Yeah.
CHALLENGER Hey, we've got another 15 seconds to go.
CHALLENGER Okay, MARK it, one minute you go to
circuit relief auto.
CHALLENGER Okay, watch your ears.
CHALLENGER Okay.
CHALLENGER There.
CAPCOM And 17, we're watching you and you look
good to us. You're GO.
CHALLENGER Okay,
CHALLENGER I had about 2/10ths.
CHALLENGER And I had 2/10ths. 37 to 35.
CHALLENGER Hey let's make sure we got everything.
You want to 40 then you went to EGRESS then we monitor suit
circuit relief auto, pressure is decay at 48. Okay, that's good.
Okay, we're GO for cabin depress.
CAPCOM Roger. Roger, you're GO for -
CHALLENGER Okay, 16 to ECS cabin repress open.
CHALLENGER Okay, repress coming open. Circuit
breaker's open.
CHALLENGER Okay. (garble) I think I'll get this
down here.
CHALLENGER They want this left in auto?
CHALLENGER Huh?
CHALLENGER Leave this in auto?
CHALLENGER What, is all you want is 16 cabin repress
open.
CHALLENGER circuit breaker
CHALLENGER Okay. Overhead to forward dump valve
open and in auto at 35. Get that one down there now.
CHALLENGER Okay, you ready?
CHALLENGER Okay, go ahead. I'll give you a call
at 35.
CHALLENGER Circuit release was auto, right?
CHALLENGER Yep. Had to be.
CHALLENGER Okay.
CHALLENGER Okay, going open.
CHALLENGER Okay, coming down. I want your auto
at 35, I give you a call my (garble) suit is going up. MARK it.
Okay, you're 35. Verify cabin 35 and latitude circuit
locked up at 43 and decaying. It's about 46 and decaying,
How's it look to you, Houston.
CAPCOM Looks good to us 17.

CHALLENGER Okay, Jack. Overhead, uh, make it forward
dump open. And I'll verify we lock up 3 -
CHALLENGER - is decaying, the auto's working.
PAO Challenger's cabin is being depressurized.
CHALLENGER And the cabin's at 1.
PAO Hatch will be opened and equipment no
longer needed will be jettied.
CHALLENGER Okay, hatch opening. Downward.
CHALLENGER When I get the hatch partially opened,
you can go to auto on that valve.
CHALLENGER Still no good words about the gravimeter,
huh, Bob?
CAPCOM No, there's an outside chance that it's
been a little cold. And they're hoping that if it warms up,
that it may take care of itself but, no, everybody's very
sad about that.
CHALLENGER Well, I could have sprinkled dirt on it
maybe.
CHALLENGER Let me (garble) to the hatch, Jack.
CHALLENGER Still about .2.
CHALLENGER Okay, want to set it in auto.
CHALLENGER I can get it from here.
CHALLENGER Okay.
CHALLENGER (garble)
CHALLENGER Turn around over here, boy I wish you
could take some of that dust out. Hit it.
CHALLENGER Better turn (garble)
CHALLENGER The hatch is open, Houston.
CAPCOM Copy that.
CHALLENGER Okay. Okay.
CHALLENGER (Garble) not out there, can I have it in
the light weight PLSS's.
CHALLENGER Okay. Here goes the old - whose PLSS is
this now?
CHALLENGER Well, look at it, if you want a memory.
That must be yours it's red. No, that's mine, no it's yours.
There goes the old Commander's PLSS.
CHALLENGER Okay, baby thanks for doing a good job.
And that was a backup PLSS too.
CHALLENGER Well, that wasn't very good.
CHALLENGER It walked down the ladder.
CHALLENGER It went down as gracefully as you did.
CHALLENGER Look at that. Okay, what's next.
CHALLENGER Well, I can give you some of these. Here
hold - okay. Everything that's in here.
CHALLENGER Okay. That's the first thing.
CHALLENGER Okay. Okay.
CHALLENGER (Garble)
CHALLENGER (Garble)

CHALLENGER Beautiful gloves.
CHALLENGER Yep. Houston, I think we ought to probably just mention, anyway. We are jettising a set of - 2 sets of EVA gloves. I think that's worth mentioning. Because they did their job - just like everything else did it's job.
CHALLENGER I jettisoned mine.
CHALLENGER Okay.
CHALLENGER Whoops, we didn't get them cleared.
CAPCOM Okay, we copy 2 sets of EVA gloves to the surface for the last time.
CHALLENGER They're very reluctant. (Laughter)
CHALLENGER What else have you got there?
CHALLENGER Is - ISS.
CHALLENGER (garble) the other ISS.
CHALLENGER Nope, one more.
CHALLENGER That it?
CHALLENGER Got one more thing.-
CHALLENGER No wait.
CHALLENGER Oh, is there something else?
CHALLENGER Watch it. Take this I'll get it.
CHALLENGER Okay, let's get this out.
CHALLENGER Okay, the old LMP's PLSS. Hope the OPS stays where it is.
CHALLENGER Okay. Okay, put your - get it down there and put your foot against it and it'll probably go. The only geologist's PLSS on the Moon. Good boy. Have fun PLSS.
CHALLENGER (garble) stay there. Okay, we got everything else. Okay hatch seal clear.
CAPCOM Pretty good.
CHALLENGER Pretty good from here. To bad we don't have a broom.
CHALLENGER Got everything out. Nothing else here to go. Nothing behind you. Nothing here. Okay. Hatch going closed.
CHALLENGER (Garble) again tomorrow.
CHALLENGER I know it.
CHALLENGER Okay, lower hatch closed. Let me see if I can't lock it. Okay, it's locked.
CHALLENGER Okay, cabin repress, dump valve both auto verified.
CHALLENGER They're all are auto and locked.
CHALLENGER Okay.
CHALLENGER Cabin repress auto verified.
CHALLENGER Verified.
CHALLENGER At 16 cabin repress closed.
CHALLENGER Repress going closed.

APOLLO 17 MISSION COMMENTARY 12/14/72 CST 00:36 GET 171:48 MC-702/4

CHALLENGER Master alarm and cabin light on. There
it is. Cabin's coming up. Okay, it's increased and you
go to ca - cabin on one red.

CHALLENGER One red. BRAVO.

CHALLENGER Cabin - (garble).

END OF TAPE

CHALLENGER Okay, cabin's corner is about 5.
CHALLENGER Okay, lights are off. Repress stopped.
Cabin pressure is stable. Okay, Houston, Challenger, we're going to take off our gloves.
CHALLENGER Hello, Houston, how does it look?
CAPCOM Roger, you look stable and stand by.
CAPCOM Okay, you're going to unsuit there guys.
CHALLENGER Speaking of suits. These things perform super.
CHALLENGER Okay, and we can get our helmets off.
CHALLENGER If I can ever get unsuited.
CHALLENGER Oh, this is funny. Yeah - yeah There's my hand. Now let me try the other one.
CHALLENGER Oh, let me get it for you. I can free yours
- another -
CHALLENGER Yeah, but I (laughter).
CHALLENGER There.
CHALLENGER The right one went easy -
CHALLENGER I think they're all really getting -
CHALLENGER Oh, and the helmet is off and I'm throwing it in the GARBLE.
CHALLENGER Well, there's no changing in our minds now, the PLSses are going to be hard to retrieve. But you could if you had to, though.
CAPCOM Challenger, Houston. From the old back up crew that followed you every step of the way super job on EVA you guys.
CHALLENGER Thank you John. Appreciate the words Jose, but we also appreciate you're helping us get it this far.
CAPCOM Rog, Neil.
CHALLENGER Hey, you know in all those things you tell people - was that Charlie? I haven't heard your voice since - you know all those good things you tell us about dust and all those other things, you know, you believe them all just like everybody else does - but you've just got to come out here and experience it for yourself to really be a believer.
CAPCOM Yeah, well I take it all back about it all looks the same.
CHALLENGER Hey, it really doesn't Charlie, but all those physical things you get handicapped with - there's a lot of easy things as far as 1/6g - but all those other things - you know there's nothing like doing it to be a believer.
CAPCOM Well, you guys did it great.
CHALLENGER Charlie it may all look the same but Taurus Littrow, mark my words, has some variety.
CAPCOM Yeah, we could tell that, Jack. Great job.
CHALLENGER Thank you, Charlie and thank you for all the help.

CHALLENGER Hey, Charlie I remember a long time ago when I said something about being down among them. I didn't know what it was until we got here.

CAPCOM Challenger we have a good word from the old program managers even though you guys were pretty picky there in bringing rocks back, we're going to let you keep them all. You only busted the red line by 40 pounds.

CHALLENGER Okay, he's a pretty good guy any way.

CAPCOM That assumes your good buddy up stairs gets a good plane change tomorrow.

CHALLENGER Oh, he will and I tell you Gene and I both have lost 20 pounds apiece on this mission.

CAPCOM We can believe that.

CHALLENGER Stand by (garble).

CHALLENGER Dave, we're on VOX anyway - let's go to ICSP.

CAPCOM It's safer that way.

CHALLENGER Yeah, specially when you don't know you're talking.

CHALLENGER Okay, we came to the end of the EVA 3 preference post card.

CAPCOM Roger, we're following you to the surface checklist.

CHALLENGER Hey, Jack and I are goint to frame this - Jack and I are going to frame this page 2-3, cut it down the middle and each take half.

CHALLENGER I'm going to take the front half. Gene will take the back half. Okay, Roberto, we're going to manage the old batteries.

CAPCOM Okay, and Challenger we're ready to manage the old batteries.

CHALLENGER The old ED batteries are 37.2 - A and B.

CHALLENGER I was just going to say I wish we had a broom.

END OF TAPE

PAO This is Apollo Control at 172 hours 8 minutes. The Change of Shift News Conference is scheduled in the MSC News Center Briefing Room for 1:30 A.M. CST, approximately 30 minutes from now.

CAPCOM Okay, we're happy with your battery management. We're ready for you guys to go to low.

CHALLENGER You got - you got low.

CAPCOM Thank you.

CAPCOM And Challenger, it's Bob. I'm going to turn you over to Casper about now, and let him put you guys to sleep.

CHALLENGER Bob, I'm not sure what you mean, who's your friendly ghost?

CAPCOM I bet you can guess.

CHALLENGER He doesn't know anything about the LM. He doesn't know anything about the LM.

CAPCOM It's never too late to learn.

CHALLENGER For you I'd believe that, for a lot of people, I wouldn't.

CHALLENGER Welcome aboard, Ken.

CAPCOM You guys make a pretty interesting show to watch.

CHALLENGER I hope so.

CHALLENGER All I can do is hear your breathing, Ken.

CAPCOM Yes, I just noticed that.

CHALLENGER Hey, Ken. Tell your friends off to the left there, that I've turned the biomed off.

CAPCOM Okay, thank you.

CHALLENGER Hello, Houston, Challenger. CDR's going off the air.

CAPCOM Okay.

PAO This is Apollo Control at 172:32 ground elapsed time. They're estimating a Change of Shift Briefing with the offgoing Orange Team Flight Director, Pete Frank and the Spacecraft Communicator Bob Parker, just being relieved after completion of EVA 3. We're estimating that Press Conference to commence in approximately 5 minutes in the small Briefing Room - Building 1 News Center. 172:33 this is Apollo Control.

CAPCOM Hey, Jack, Houston. Are you busy?

CHALLENGER Say again, Ken.

CAPCOM Are you busy? I'm sitting here looking at a couple of questions that they wanted to ask, and whenever it's convenient for you - I'm not sure just how busy you are right now, and just keep in mind I've got a few questions to ask you on the traverses and give me a call when you're ready to talk about it.

CHALLENGER Okay, we're unsuited, Ken, let's get unsuited and then we'll be back with you.

APOLLO 17 MISSION COMMENTARY 12/14/72 CST 01:02 GET 172:08 704/2

CAPCOM Okay, just whenever it's convenient for
you.

PAO This is Apollo Control. The Change of
Shift Press Conference is prepared to begin at this moment.
We'll take down the Air-Ground Circuit at this time and play
back accumulated tape at the conclusion of the Press Con-
ference. At 172:44, this is Apollo Control.

END OF TAPE

PAO This is Apollo Control at 173 hours, 3 minutes ground elapsed time. The crew aboard Challenger at this time still unsuiting, getting prepared for bedding down for their final night on the lunar surface, final Earth night that is, in as much as they're in a middle of a 14 hour lunar day. Spacecraft America now behind the Moon on the end of the 43rd lunar orbit. There are about 55 seconds of tape from the air/ground 1 contact with the lunar module Challenger which were accumulated during the just completed Change of Shift Press Conference. We'll play back that tape at this time and continue live with the remainder of the communications prior to the sleep period for Cernan and Schmitt at Taurus-Littrow.

CAPCOM Challenger, Houston.

CHALLENGER Go ahead.

CAPCOM Hey, how about if we get a pull on the DSKY and get it into P00 and back in stand by. We're worrying about the clock registers overflowing, and we'd like to get that done before 172:50, or somewhere in that neighborhood.

CHALLENGER Okay, stand by. Is that what you wanted.

CAPCOM Na, we can't watch it Jack, if you just tell us if you've got it into P00 and back in the P06.

CHALLENGER That's what happened.

CHALLENGER I thought you watched it the other night.

CAPCOM No, we don't have any high bit rate now.

CHALLENGER Hello, Ken, how do you read Challenger, CDR.

CAPCOM Loud and clear.

END OF TAPE

CERNAN Houston, Challenger, how would you feel about this canister being changed now.

CAPCOM Stand by. Okay, change 'er out, Geno.

CERNAN Okay.

CAPCOM For your information we're trying to negotiate some time for you here. We're about one and a half down and we know how to pick up one hour of it, we aren't quite sure as to how to gain the other half.

CERNAN Okay doke, well, we're all unsuited now and we're about ready to talk and eat at the same time or listen and eat here at the same time and it wont be long until we're ready to hit the sack.

CAPCOM Okay, fine. Ken's trying to negotiate the question sessions for you here.

CERNAN Canister's changed out now.

CAPCOM Thank you.

CERNAN Okay, Ken, we're on and ready for that debriefing and you should be getting Jack's file on that also.

CAPCOM Okay. Okay, before we start on those questions, are you prepared to copy some lift off times in your data book and that kind of stuff.

CERNAN Give us about 10 seconds.

CAPCOM All right.

CERNAN Go ahead, Ken.

CAPCOM Okay. This is REV 44, lift off 174 plus 13 plus 49. TPI 177 plus 01 plus 00. Okay, I'll give you just the lift off times, 'cuse me. REV 45 176 plus 12 plus 19, 178 plus 10 plus 49, 180 plus 09 plus 20, 182 plus 07 plus 50, 184 plus 06 plus 20. REV 50 is 186 04 50. Over.

SCHMITT Okay, Ken, starting with 44, 174 13 49. 176 12 19, 178 10 49 180 09 20 182 07 50 184 06 02 186 04 50. And what's the present REV, please.

CAPCOM Okay, we're coming up on forty, infact it looks like we're in 44 right now. Okay, and Jack, how about let's confirm the REV 49 was 184 06 20.

SCHMITT Oh, I did have that wrong, in the seconds, 20 seconds.

CAPCOM That's affirmative. Okay, and we've got your biomed coming through.

CERNAN Well, on one, am I alive.

CAPCOM Just barely.

SCHMITT Ken, I'd like to believe that you read that one wrong because I've gone through 50 copies of that without a mistake.

CAPCOM Well, I'll settle that with you -

SCHMITT 50 REV.

CAPCOM All right, sir, and -

SCHMITT Okay.

CAPCOM - looks like it's about time for an eat period and I've got these questions for you but let's keep in mind that that's secondary and if it ever gets in the way of eating, why holler up and we'll just drop it right there. We're about an hour and a half behind the time line and we're going to make up no more than an hour of that.

CERNAN Okay.

CAPCOM Now, I think -

CERNAN Okay, Ken, we're cutting into the chow and go ahead.

CAPCOM Okay, uh - would you like for me to just read you all the questions and let you mull those over before you work on it or do you want to do one at a time.

SCHMITT One at a time is better, Ken.

CAPCOM All right, sir. Number 1 wanted to know if the blue grey rocks at station 6 are similar to those at station 2.

SCHMITT Ken, I think they are but I think you'll find that the ones at station 6 are much more metamorphic rock or recrystallized rock than the ones we had at station 2. I had the impression that the ones we were sampling at station 6 were really inclusions in the anorthositic gabbro and had been probably considerably metamorphosed by it being included in it. Whereas the ones we had at station 2 were a separate rock type apparently, as I recall it, anyway.

CAPCOM Okay, that's good.

SCHMITT Ken, let me just say that I - my impression is that there was a lot more action in the rocks at station 6 than at 2. I saw a lot more, a lot more was evident, the inclusions, some of the patterns, some of the other things we saw.

CAPCOM All right, sir. Let's go on the second one and it said, do we understand that there were no breccias at station 8.

END OF TAPE

CHALLENGER - in the one that pyroxene plagioclase rock, was a breccia in the sense it was fractured, it was ejected by dark glass, but it would be what we would call a mosaic breccia, in that respect I think. And not the - didn't see any station 6 or station 2 type breccias there at all. Other than the subfloor gabbro that pyroxene plagioclase rock was the only major rock type I think we saw. Unless we picked something up in the rake sample.

CAPCOM Okay. Okay, third one says what are your impression of the distribution of the familiar subfloor gabbros throughout the EVA-3 traverse?

CHALLENGER Well, I don't know - I think we discussed that a little bit on the traverse - quite a bit as a matter of fact. The impression I had was that most of the traverse on the plains with the one exception of - of Van Serg Crater were - we were in box fields or fragment fields that were almost - well, were dominately subfloor and visually from the Rover, I had no impression of any other significant rock type with the exception of a occasional blocks of the gray variety of the subfloor gabbro. And I don't - Gene - I don't know Gene's impression was, he was driving a lot but pass it on. I think - well actually commented (garbled) coming back out of station 6 and 7 and then back off at - coming back down at 8 how the terrain features changed, I think that was due principally to the - to the what we've been calling the subfloor material evident, and there again it was what I would say particularly mantle filleted much like we have here where the LM is with the exception of Van Serg where we actually saw fragmental boulders for the most part a lot less buried, sitting on the surface.

CAPCOM All right sir. At Van Serg some rocks were described as gray breccias and some contained light fragments. Was there a variety of breccia present?

CHALLENGER I think - I think not Ken. My impression was that there was a variety only in their - in the degree to which they were fractured. We found and sampled I think the two major - one extreme - extremely fractured rock that I said was pliable in any way it broke into small pieces very easily with a hammer or in you hand if you worked at it. And the other was breccia that was not - was much more cohesive than that. It was not fractured or pliable at all but they both were on the rim and I think they were just varieties of probably shock fractury.

CAPCOM Okay. Could the Van Serg breccias correlate with the blue gray material at Cochise?

CHALLENGER That's possible I guess. But my first guess would be that the blue gray at Cochise was blue gray subfloor and well I don't know, that's a good question. That's a good question. We - maybe with the pictures we have we can work out the an attitude - approximate attitude on that contact that I

CHALLENGER talked about on Cochise and see if it would project over reasonably to Van Serg. I wouldn't be surprised if it would. That's a good - that's a good point. To me they look very similar.

CAPCOM Okay. And you guys sure -

CHALLENGER But - but - Ken, Ken, Ken -

CAPCOM Go ahead.

CHALLENGER Yeah, we're eating. We're fixing and eating at the same time.

CAPCOM Getting mighty efficient. Go ahead. You're starting to say something.

CHALLENGER You just - Ken, I think from a distance we saw the blue gray in Cochise. You couldn't make a definite correlation. But it's a good idea and ought to be considered as one of the possibilities. The other is that we just had a window in the subfloor that coincidentally - I mean what's underneath the subfloor might be that breccia. Coincidentally - the Van Serg impact hit that window.

CAPCOM Okay. You all were saying about the (garbled) of Van Serg was at a class in the breccia.

CHALLENGER Negative, it was a - excuse me, I have my mouth full.

CAPCOM It's about time.

CHALLENGER It was an ag - aggregate irregular looked like a glutenated glass in fragments just sitting on the rim of Van Serg. And the reason I said I thought it was in place or has fallen there and crystallized there is that there were 4 or 5 similar fragments arranged in a small coherent area. Not making that very clear I don't think, but it looks as if it hit and broke apart upon hitting a little bit but didn't really splatter or - or break apart in any significant matter.

CAPCOM All right.

CHALLENGER There are - similar things I tell you what it looks like, if anybody'd walked up the rim of Kilowayeeke, in the ash out there and on top of the ash there are bombs that were fairly clearly molten when they hit and they just enough spring to break and when they hit - but they - the individual pieces didn't move very far at all. And you can see that pattern on Kilauea-iki. And it was the same kind of thing except that there was no directional aspect of it here.

CAPCOM Okay.

CHALLENGER And that's not to say it's volcanic glass. That's just the kind of pattern it was.

CAPCOM Okay. Can you tell us if the dark material in the bottom of Van Serg was similar to the collected rim material.

CHALLENGER I think so except that as Gene pointed out the glass was coarser. Was coarser in the bottom than what anything we saw in the rim.

CAPCOM Okay. Are there any distinctive features other than color to separate tan from blue gray breccias? Such as joining or massive nature or continuity, anything of that nature.

CHALLENGER We're - where did we find those tan breccias?

CAPCOM Challenger, this is Bob, I think we were talking about some of them I think at station 1 the first night. We had both (garbled) didn't we have two of those in the same rock together?

CHALLENGER They were both gabbros.

CAPCOM Jack, excuse me -

CHALLENGER Tan gabbros and blue gray gabbros.

CAPCOM Roger. Okay, yesterday, excuse me I wasn't reading the question. Okay, the breccias - they were tan and blue gray breccias yesterday at station 2 were there not? You have the 2 types of breccias at station 2.

CHALLENGER Well, yeah. Yeah, that's right. And now as I think back I guess that's the main difference between the tan rocks at station 2 and station 6, but the ones at 6 appear to be having a igneous texture or at least a very crystalline texture and inclusion like masses of other rocks whereas the ones at station 2 had - they seem to be fragment breccias, as I recall.

END OF TAPE

CHALLENGER - and the ones at station 2 they seemed to be fragment breccias as I recall. That's right, although they may have been recrystallized or metamorphosed, they were clearly breccias at station 2. I just forgot about that.

CAPCOM Okay, copy that. Okay, and can you amplify your description going out to station 6. In particular were there blue-grey and tan-grey bands on the North Massif?

CHALLENGER Rather than bands, there were lines that appeared to be the upper terminus of the - of the source of the boulders that were strewn below that line. And those lines tended to be either - show a blue-grey source or a tan-grey source, as you will. (garble).

CHALLENGER Oh, those up banks.

CAPCOM Challenger, if you think you're talking to us, you're breaking up badly.

CHALLENGER I just thought you might be interested, we just had a little spurt of dust come up by the window.

CAPCOM Was there a sleigh with it?

CHALLENGER Wise guy.

CAPCOM Okay, did you see very much of dust, or was it just one little shot?

CHALLENGER Can I - one little shot, it was actually just particles. Something we threw out must have popped.

CAPCOM Okay, do you have any preliminary stratigraphic sequence for the plains?

CHALLENGER For the plains, huh? Well, my guess would be that the Van Serg breccias were the oldest rock. The gabbro sub-floor gabbro's the next oldest and the mantling material is the youngest. But that's - the only good clear relationship was mantle on top of the sub-floor gabbros. I - we really don't have a good relationship of the breccias and I just - I guess I lean towards thinking that that Van Serg was a window in the sub-floor rather than being a bed of some kind, on top of the sub-floor.

CAPCOM Okay, and do you have an opinion on what underlies the Sculptured Hills?

CHALLENGER Well, I think we've been to - the rake sample is probably going to tell the tale there. My guess is from the boulder - boulders and sub-floor around up there that are of gabbro and maybe the Sculptured Hills are a version of the sub-floor rock. I don't think that the orthopyroxene anorthosite rock was necessarily indigenous to the Sculptured Hills. It was glass coated and permeated by glass so I suspect it may have been thrown there by an impact somewhere else.

CAPCOM All right sir, we've got one last thing for you to clean up. Back on page 76 of your checklist, it looks like we may have skipped some steps on the gas return valve, and like to make sure that you get to AUTO and the gas diverter pushed to CABIN before you stow the oxygen hoses.

CHALLENGER Okay, Ken, we got cabin gas return AUTO.

CAPCOM Okay, understand AUTO and you got the

CAPCOM select to CABIN?

CHALLENGER Yeah I got diverter pushed to CABIN and we're trying the PGAs now.

CAPCOM All right sir.

CHALLENGER And I guess if - if you could go in - my feeling is if you go to the bottom of every one of those large craters like Camelot, you could examine some of these fragments on the walls and down there near the bottom, I just get a feeling you'd find this - this blue-grey breccia down there.

CAPCOM All right sir.

CHALLENGER I mean in all the big craters like Camelot. Well we - I think maybe that's true, however, we did not see isolated fragments of it very often, if at all, out here on the , the plains themselves, away from the craters. So if the blue-grey breccia does - the Van Serg breccia does underlie the sub-floor, the craters are not - it's far enough that the craters we have apparently have not penetrated and brought up much of that kind of material. Well that's it.

CAPCOM Okay guys, it's time to press on and finish up chow time and I've got your stowage summaries whenever you're ready for that, to get started on.

CHALLENGER Okay, Ken let us finish eating, then we'll go back to work.

CAPCOM Okay, give me a call when you're ready.

CHALLENGER I'll help you in just a second (cuts out).

END OF TAPE

CHALLENGER Okay. Okay. Ken I'd like to go ahead and hear your recommendations on Taurus and I'll write it down.

CAPCOM Roger, page 2-2. I've got some numbers to fill in at the bottom under the collection bag stowage.

CHALLENGER Okay, I've got it.

CAPCOM Okay, number 1 with the aft engine cover is bag 8. And then the second line it's bag seven. The third line it's bag six left hand and five right hand. And the last line is bag 2 and 4. And you can disregard the max weights.

CHALLENGER Okay just so we got it straight after the engine cover bag 8. Left hand side bag 7. Left hand plus the right hand side, number 6 left hand and five right and the ISA bags 2 and 4.

CAPCOM That's affirmative.

CHALLENGER Okay.

CAPCOM Hey, Jack, the people down here watching things noticed that your suit ISO valve is still in disconnect if you're trying to dry the suit out you might check that. It's your option what you want to do with it.

CHALLENGER I'm glad somebody is watching things. Thank you.

CHALLENGER Ken we're in the process of getting all these bags in the proper places now.

END OF TAPE

CHALLENGER Ken, this is Jack, why don't you make a note that bag Bravo is empty with miscellaneous photos since the last report on it.

CAPCOM Okay.

CHALLENGER And, Ken, we're stowing Mag Nancy at a reading 153.

CAPCOM Okay, copy 153.

CHALLENGER Houston, Challenger.

CAPCOM Go ahead, Geno.

CHALLENGER Okay, Ken we're - all we've got left to stow now is the buddy PLSS bag and that's in work. And we got all the ETB stuff taken care of. All the other bags are stowed per your recommendation. We'll be configuring these pads for sleep and putting up the hammock here shortly and as soon as we can get cleaned up personally a little bit we'll be in the sack.

CAPCOM Okay, sounds great.

CAPCOM Hey, Geno, GARBLE they're looking at that buddy PLSS bag and suggested ya'll make sure that you're going to have room to do the equipment jettison and get the hatch open and all that. They had planned on stowing it the next day.

CHALLENGER That's a good thought, Ken. Thank you, Ed. The fact is that probably may think more convenient - we were going to be smart and get ahead here but thank you.

CAPCOM The faster I run, the behinder I get.

CHALLENGER I keep forgetting these checklists have been exercised a hundred thousand times.

CAPCOM Yeah, we keep remembering that.

CAPCOM Challenger, Houston. If you'll just give us a call when you're ready to sack out we won't bother you and just that way we can keep track of what you're doing and you're about ready to go to bed and we'll get you up at an appropriate time.

CHALLENGER Okay, Ken, this is Jack. I guess I have the duty BIOMED tonight so I'll give you a call when we're turning out the lights.

CAPCOM Okay.

CHALLENGER And it won't be too long.

CAPCOM All right. You guys are doing pretty good, you're almost caught up.

CHALLENGER Hey, Ken, working through this thing we haven't been able to find instructions for the stowage of the EV gloves. Do your friends back there have any recommendations?

CAPCOM Okay, stand by one and I'll check on that.

CAPCOM Okay, Jack, we can stick those things on the COMM panel for now and then tomorrow on page 7-14 it's going to have you stow them in the LEVA bags but for the time being if you just stick those up on the panel, set them aside - you'll use them tomorrow.

APOLLO 17 MISSION COMMENTARY 12/14/72 03:16CST 174:24GET 710/2

CHALLENGER Okay, Ken got you. Yeah, they're going to get the inside of the LEVA pretty dirty.

CAPCOM Well, from what we've seen, Jack. I think everything's going to be about the same color by the time you get through.

CHALLENGER Okay, it didn't bother your EVA did it Ken to have a little dust in your helmet?

CAPCOM No, no - that's kind of nice to have.

CHALLENGER Hey, an experienced fellow like you might have a recommendation on how to get my visor up.

CAPCOM Yeah, give it to the CMP.

CAPCOM We were just debating down here how come you guys threw away those nice clean gloves and kept the dirty ones.

CHALLENGER I wish you hadn't ask that Pete. We were just debating that too.

CAPCOM How long are your arms, Jack.

CHALLENGER You do all sorts of things.

CHALLENGER Hey, they're out on the porch as a matter of fact. That's not too far fetched. I guess there's some old friends you just hate to get rid of, Pete.

CAPCOM Yeah, that figures.

CAPCOM And you guys have had some real winners there don't change a good life.

CHALLENGER Well, they seem to do all right for us -

END OF TAPE

CHALLENGER Well, they seem to do all right for us. I guess that's the way we were half way thinking, but not thinking very well, as was witnessed in our checklist procedures tonight.

CAPCOM Ah, you're doing outstanding.

CAPCOM Challenger, Houston. On your COMM your checklist will call for going to down voice backup. And, tonight, we'd rather just leave it in the normal voice, so if you leave the configuration you have rather that change it. That would be a good deal for us.

CHALLENGER Okay, Ken, I only got part of that, I was scrubbing my face here. You want to save the same COMM configuration we've got right now, is that correct.

CAPCOM That's affirmative.

CHALLENGER Okay, that's easy.

CHALLENGER Yeah.

CHALLENGER Okay, Ken. Gene just stowed the EVA antenna.

CAPCOM Copy.

CHALLENGER And I'll be off COMM here just for a few minutes Bio med so, I'll be back with you when I turn in.

CAPCOM Okay. I may have misled you earlier, when I said, we weren't going to lose any time. We can - we can get you 8 hours here up to about 19 after the hour. And, after that we're going to have to start rearranging things to get 8 hours.

CHALLENGER Well, Gene's almost in his hammock now, and I will be shortly, so I think we're probably in pretty good shape.

CAPCOM Okay, that's fine. I just - I didn't want to mislead you.

CHALLENGER That's all right, you never misled me before.

CHALLENGER Well, let me think about that.

CAPCOM Still think you came down awful slow, if that's true.

CHALLENGER Right.

CHALLENGER Ken, I'm going to take off my headset here and jump into the hammock. What time are we getting up CET - Central time.

CAPCOM Well, it's going to be roughly 45 minutes past the time listed in 182:39. So - Are you asking for it local time?

CHALLENGER Yeah, I - my watch is set on Houston Time, what time will it be? 8 hours from when?

CAPCOM Be about 12:15, Geno.

CHALLENGER Okay, that sounds great, Deke. It won't - We're just cleaning up a few minor things and we'll actually probably be asleep in the next 10 - 15 minutes.

CAPCOM Okay, sleep good. You've had a lovely day. Hope tomorrow -

CHALLENGER Sorry to keep - Thank you boss, sorry to keep you up so late. But, appreciate it very much.

CAPCOM We're enjoying it.

CAPCOM Hey, Gene, before you unplug your mike -

CHALLENGER Okay, I'm going off the air.

CAPCOM - check your - check the suit Flow valve. Looks like it's not flowing if that's the configuration you want.

CHALLENGER Yeah, we've got them both flowing. And we've got good circulation in the cockpit. If it looks good to you down there - we're in good shape up here.

CAPCOM Looks fine. See you later.

CHALLENGER Okay, we thank you much.

PAO This is Apollo Control at 175 hours 21 minutes ground elapsed time. The crew of Challenger has signed off for the night, climbing into their hammocks. The Commander, Gene Cernan in the upper berth, Lunar Module Pilot, Jack Schmitt in the lower hammock, scheduled 8 hours sleep period, wakening shortly after noon, today. Command Module America apparently in a 67.8 minus 54.9 nautical mile orbit. Command Module Pilot, Evans has 4 hours and 22 minutes remaining of his sleep-period before being awakened, for plane-change maneuver and a trim maneuver, to get in the proper orbital plane for rendezvous. And at 175:22 taking down the air-ground 1 line, until somebody wakes up, this is Apollo Control.

END OF TAPE

APOLLO 17 MISSION COMMENTERY, 12/14/72 05:00CST 176:06GET 712/1

PAO This is Apollo Control at 176 hours 7 minutes ground elapsed time in the mission of Apollo 17. Command Module America about 1/3 of the way through frontside pass on revolution 45. Fifty-two minutes remaining until America coasts behind the moon. The crew aboard Challenger, meanwhile is settling in for 8 hours sleep schedule sleep period which will end shortly after noon today, central time. Three hours 37 minutes remaining in the Command Module pilot's sleep period. Command Module America presently in a lunar orbit measuring 55.1 nautical miles at pericynthion by 67.7 nautical miles apocynthion. Gold team of flight controllers settled in for a 12 hour shift today, on a quick turn around. And at 176:08 ground elapsed time this is Apollo Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/14/72 07:00 CST 178:07 GET MC-713/1

PAO This is Apollo Control at 178 hours 7 minutes ground elapsed time. Command module, America, at the present time on the 46th lunar orbit immediately over the Taurus-Littrow landing site where the crew of Challenger has approximately 5-1/2 hours remaining in their sleep period. Evans, meanwhile, has some hour and 37 minutes remaining in his scheduled sleep period before wakeup call is made. For the coming day's activity, including a trim maneuver to tune up the command module's orbit and a plane change maneuver to place the command module in the proper orbital plane for the rendezvous which will take place after the lunar module has lifted off the lunar surface and is placed back into orbit around the Moon. The command module spacecraft systems are all functioning normally at this time according to the flight controllers here in the Control Center. Some 49 minutes remaining until America goes behind the Moon. At 178:08 ground elapsed time, this is Apollo Control.

END OF TAPE

PAO This is Apollo Control at 179 hours
41 minutes ground elapsed time. About a minute until we have
lock-on with the Command Module America on the 47th revolution
around the Moon. Shortly after we have good solid lockup,
the Spacecraft Communicator Ken Mattingly will call Ron Evans
on Air-Ground 2 circuit for a wakeup. We'll bring that up
at that time. Meanwhile the crew in the lunar module, Chal-
lenger, is still asleep at this time, with some 3 hours re-
maining until they're awakened. Standing by for word that
we've locked onto the command module downlink. We've had
acquisition. We'll bring up Air-Ground 2 and standby for
the wakeup call to command module America.

CAPCOM Good morning, America. Rise and shine.

CAPCOM Hello, America, this is Houston. Over.

AMERICA Hey Houston, this is the Command Module
Pilot in the United States Space Ship, America. I'll be
ready to go to work as soon as I can get untangled.

CAPCOM Okay, we got plenty of that for you.

AMERICA (laughter) Okay, I think I woke up just
before you called - for some reason.

AMERICA The VHF is OFF.

AMERICA Houston, at least it's daylight today.
Yesterday you got me up in the middle of the night.

END OF TAPE

CAPCOM Ah, this is a gentleman's day.
AMERICA (Chuckle) right.
AMERICA Guess it's really a 2 hour day, when you
go around the Moon, isn't it?
CAPCOM You don't get so tired that way.
AMERICA (Laughter) Right.
AMERICA Okay, (garble) mode is to voice, squelch is,
this is off, I'm going to leave it in (garble) minute and manual
(garble).

AMERICA Houston, America. If you happen to have a
summary report of EVA 3, I'd sure like to hear it.

CAPCOM Okay, we'll do that. Let me give you a
quick run down on review of what we're going to do this
morning. And, we've got the extra RCS trim burn that's going
to be coming in. And I've got a Pan for that guy and I have
about 1, 2, 3, 4, 5, 6, 7, 8, 9, one-liners to go into your
flight plan, to bring it up to date. The general plan is to
do a minus X RCS on the trim maneuver, in order to avoid
impinging on the SIM bay, that burn will be about 30 seconds
worth. And that's going to give you about 9 foot per second
DELTA V. The maneuvers have all been checked out, and it's
a reasonable timeline. And, so I have both the plane change
and the trim PAD's for you. And that may cut into your eat-
period just a little bit. So, you might keep that in mind,
that when you get a chance to nibble that's probably a good
thing to be doing. And then once we finish the plane change,
we're going to be back on the nominal flight plan and press-
ing on in a - just like we have been. We'll be leaving
the mapping camera in and taking pictures with it still retracted
in an attempt to avoid increasing the number of cycles on
the camera. And we'll be running the SPS PU valve in the de-
creased position, in order to optimize our propellant modings.

AMERICA Ah, ha. Okay. That sounds like it's good.

CAPCOM So when you're ready to copy some of
those things, might be a good thing to get started on. So
go ahead and finish squaring away your cockpit. And while
they're putting together an official summary I can tell you
my unofficial summary of EVA 3 and is that that sure is super.
You've got to watch those tapes when you get down. That's really
a - that's really a spectacular place as you can probably see.
And they found a lot of mighty interesting rocks there.

AMERICA Oh, it's real good.

CAPCOM Jack, being the crew-geologist is making
up new geological terms as he goes along.

AMERICA (Laughter) I can - yeah, I bet.

CAPCOM What you ought to do is, when he get's
aboard, you ought to tell him that you saw a bunch of vertical
diclates over on the north side of the Massif. Tell him

CAPCOM they were very dark, very small.

AMERICA Vertical diclates?

CAPCOM Yeah, I think that's the word he coined on the way down there.

AMERICA Diclates? Okay. (Laughter)

AMERICA Hey, I got a update book here, I guess it'll be good for a print book - printing the mode on.

CAPCOM Okay. In general, let me tell you also that your RCS is 4.7 above the flight plan. And just as a summary, unless you want to plot them, I'll just tell you that with the oxygen and the hydrogen are doing good things. And you've got plenty of it. And I'm ready to give you ah - The first PAD will be a trim RCS burn and the second will be the plane change burn.

AMERICA Okay. No, that's good on the hydrogen and oxygen. And I might copy the trim P30 PAD.

CAPCOM Okay, I'll give you the trim. RCS G&N 37416, GET 181:34:0122 plus 000:92 all zips and all zips. Roll 180, 179 316, 00673 plus 00624, 00092, 030, 00092, 13, 29, 23, 299. And at Sirius and Rigel 118, 159, 349. This will be 4 jets minus X on the RCS. And I'd like to just add a comment here about the attitude. This attitude is one that's computed after you've gone to the plane-change rest mat and when you call P41 you'll be getting a different set of attitudes computed out of it, because of the P41 computing a plus X burn. But, when you're in attitude and P41's called and you get to the DELTA V register you should be able to put all the DELTA V in one axis.

AMERICA Oh, okay. This really is a posigrade burn is what you're saying. And I really won't be able to trim it.

CAPCOM I'm not sure I understood your comment there.

END OF TAPE

AMERICA In other words, we're not changing NOUN 81, you know, like we do on the SEP maneuver.

CAPCOM Oh, that's correct. You're going to see the numbers go to zero during the burn.

AMERICA Okay, real good. We just won't be the right attitude, we'll use the verb 29 maneuver and use that attitude.

CAPCOM That's correct and when you get there, that should put it all in the X-axis.

AMERICA Okay, mighty fine.

CAPCOM Now I'm ready for the readback.

AMERICA Oh, let me read it back. Okay, will be G&N RCS for the trim burn rate is 37416, TIG is 181340122, I'm not sure on the second, is that correct?

CAPCOM That's correct.

AMERICA Okay, noun 81 plus 9.2 and that's 00, ROLL 180 PITCH 179 YAW 316, HA is 67.3 perigee 62.4 delta V total is 9.2, burn time is 30 seconds delta VC is 9.2, sextant star is 13, shaft is 292.3, pleniun is 29.9 and Sirius and Rigel 118, base potential line and YAW line is 349 and it'll 4 jetts minus X and it'll be at the plane change REFSMMAT.

CAPCOM Okay, and that PITCH aline is 159.

AMERICA Okay, PITCH aline 159.

CAPCOM Okay, the next one will be the plane change and I'll have that ready in just a second.

AMERICA Okay, I'm in the flight plan for that one.

CAPCOM Okay, stand by for just a second.

CAPCOM Okay, LOPC SPS G&N 37416 plus 038 plus 09218233 5300 minus 00179 minus 03655 minus 00069 ROLL 0, PITCH 0, YAW 315 00627 plus 00626 03660 02003538221489 195 Sirius and Rigel and the ROLL PITCH and YAW lines are the same 118 159 349. This will be 4 jets and 12 seconds.

AMERICA Okay, LOPC SPS G&N 37416 plus 038 plus 0.92 TIG 1823353.00 NOUN 81 is minus 17.9 minus 365.5 and a minus 6.9 ROLL 0 PITCH 0, YAW 315 HA 62.7 perigee 62.6 (garble) is 366.0, burn time is 20 seconds, delta vc 353.8 sextant star 22 shaft 1 48.9 and 19.5 Sirius and Rigel 118159 349, 4 jetts 12 seconds.

CAPCOM Okay, a good readback. And I've got a couple of flight plan things to give you when you're ready for them.

AMERICA Okay, I'm with you.

CAPCOM Okay, the first one is at 180 hours and 20 minutes.

AMERICA I've got it.

CAPCOM Okay, we owe you an attitude there and the attitude will be 179222359, the high gain PITCH minus 39 YAW 145. Why don't you read them back, individually as we go along.

AMERICA Okay, ROLL 179, PITCH 222, YAW 359, high gain will be minus 39 and 145.

CAPCOM Okay, and that's at 180:20, that's with the VERB 49, the next one is at 181:35 which is on the next page and it's going to be at VERB 49, maneuver to LOPC, what we're going to do here is 2 separate maneuvers, we're going to do a maneuver, which is a ROLL so that when you do the next one, you'll avoid the gimbal lock because of the direction that the CMC would normally maneuver you in. So this maneuver is going to be in 2 parts, the first one we're calling a VERB 49 maneuver to the gimbal lock avoidance attitude at 181:35. That attitude 081181 and 317, the high gain PITCH minus 19, YAW 227 and AUTO and narrow for AOS.

AMERICA Okay, at 181:35 we'll have a VERB 49 that will gimbal lock the brakes, ROLL 081181 and 317, high gain will be a PITCH of minus 19 and YAW 227, AUTO and narrow for AOS.

CAPCOM Okay, now at 181:43, you can just skip that high gain call out. At 181:45, we want to add a VERB 49 maneuver to the LOPC burn attitude.

AMERICA Okay, at 181:45 VERB 49 to LOPC burn attitude.

CAPCOM Okay, now on the next page, we go over to 182:15 and I want to add a PU valve to decrease.

AMERICA 182:15, PU valve to decrease.

CAPCOM Alright, sir. And I have 2 more to give you, but before we do that - how about let's terminate the jet monitor by calling P30 P20 and a VERB 21, NOUN 26 to all zips and then we can uplink while we're finishing.

AMERICA Okay, you have ACCEPT.

CAPCOM Okay, and you got the monitor terminated.

AMERICA Yes, it's terminated.

END OF TAPE

AMERICA I guess we went through P30 faster than it showed up down there, or went into P30 not through it.

CAPCOM Okay, why don't you put the pan camera to STANDBY and the power ON while we're about it and we can let them look at that stuff while we're getting the rest of our flight plan updates.

AMERICA Pan camera STANDBY power is ON.

CAPCOM Okay, thank you.

CAPCOM All right let's go back to our updates and the next one should come at 182 44.

AMERICA Okay, 182 44.

CAPCOM Okay at 182 44 I want to delete the mapping camera extend.

AMERICA Okay delete the mapping camera extend. Wait a minute. I scratched that to open in recovery when we got to that.

CAPCOM Yeah, you won't do that because we're going to take the pictures anyhow.

AMERICA Yeah, okay.

CAPCOM Okay, then the next thing we want to do is at 182:48 just a half inch down. I have a new attitude for you. Where it says 097 068 019 it's now going to be 096 097 and 352 and the orb rate attitude is still all zeroes.

AMERICA Okay the attitude after the P20 (GARBLE) plus X burn will be 096, 097 and 352 and orb rate is 0.

CAPCOM Okay, that last angle was 352. I'm not sure we got that right.

AMERICA Okay 352 for yaw. That's correct.

CAPCOM All right, sir. And while we're about it why don't you take the pan camera power back off.

AMERICAN Okay pan camera power is off.

CAPCOM Okay, and as long as we're talking about pan cameras let's go to 183 45.

AMERICAN Be 345 okay.

CAPCOM Okay, and after the pan camera block want to add V over H override to high altitude.

AMERICA Okay, that's pan camera STANDBY, stereo and POWER, put V over H to high altitude.

CAPCOM That's affirmative and the last update is on the next page - 184:27. And it says mapping camera retract and since we didn't extend it you don't have to retract it.

AMERICA Ah - sounds logical. Okay, mapping camera - delete the mapping camera retract.

CAPCOM All right, sir. And let's see what else we have here - how about running your paw over most of your BIOMED sensors. Looks like you've got some noise on there. And avoid changing them. Why don't you just kind of rub on each one and see if we can get it to come in a good signal.

AMERICA Okay. I'll do that.

APOLLO 17 MISSION COMMENTARY, 12/14/72 09:04CST 180:11GET 717/2

CAPCOM Okay, you're making process there.
AMERICA Hey, it's working, huh?
AMERICA Hey, there's old Hadley Rille out there.
That's a pretty deep little (garble). Hey you really didn't
get a perspective of that thing, at least I didn't from some
of the pictures. Not till you had a chance to get up here and
take a look at some of the other things.
CAPCOM Okay, I'll tell you when we get through.
AMERICA Okay, that's the last of the flight plan
things, huh?
CAPCOM Yes sir, that was the last of the flight plans
and I still need a morning report from you and things like that
and I'll keep an eye on the clock down here and try to help you
stay on the timeline. The one thing that I see that may have to
change is I gave you a DELTA VC for the RCS burn that wasn't very
useful and we have to set it up to count in the other direction.
There's a couple of things you can do - like set it to 100.
AMERICA Yeah, okay.
CAPCOM It's just a backup monitor anyhow and so it's
setting it to 100 is probably the first thing to do.
AMERICA Yeah, I know.
AMERICA Okay, let me see if I've got time to put some
hot water in my eggs.
CAPCOM Okay.
CAPCOM Okay, Ron the computer is yours whenever you
want to go to block.
AMERICA Sleep last night was probably about 6 hours -
kind of intermittent - but it seemed to me like when I was sleeping
I was sleeping pretty good. For some reason I woke up a couple
or 3 hours after I went to sleep and I got to sleep about an
hour late. Oh, and I was just itching like a son of a gun.
CAPCOM What's that the sensors?
AMERICA The only thing I can think of - no, my arms -
you know my forearms -
CAPCOM Oh, I see.
AMERICA From the wrist back to the elbow.
CAPCOM Okay.
AMERICA The only thing I can think of is maybe the
old beta cloth itch, you know. Then I looked around and there
was nothing there. You know, no hives or anything like that. So
I got out some of that carrying cream and put that on and that
stopped it and went back to sleep.
CAPCOM Okay. It's coming up on time to start our
first VERB 49 maneuver which can keep me running and I'll watch
the angles while you put a little hot water in your food there if
you want to.
AMERICA Okay, I've got a target load I guess in desired
orientation. Okay, 2 VERB 499 VERB 25.

APOLLO 17 MISSION COMMENTARY, 12/14/72 09:04CST 180:11GET 717/3

AMERICA GARBLE, plus 179.00, plus pitch 22, 222
00 GARBLE, yaw 359 plus 359 00. Okay, I'm still saying 2 tenths
of a degree per second proceed to GARBLE proceed -
CAPCOM Okay, and the high gain to AUTO, please.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/14/72 09:14 CST 180:21 GET MC718/1

CAPCOM Gain to auto, please.
AMERICA High-gain is in auto and we'll zip that
at minus 39 yaw 145 (garble).
AMERICA Hey, Ken, I'm going to be off the head
set here while I change back to my COMM carrier.
CAPCOM All right, sir.
AMERICA Okay. My PRD 15044.
CAPCOM Copy that.
AMERICA I got (garble). Those are easy to fix.
AMERICA Had three jugs of water.
AMERICA Okay, we're going ATT 1 rate 2. Yeah.
Oh. Star number 11 - aldebatan.
CAPCOM You lucked out.
AMERICA Yeah, that's a good one.
AMERICA It's a long ways off.
AMERICA Okay, proceed, it was aldebaran.
B is proceed. 2 to proceed. 6. You notice, these are
hard to recognize when you talk to them. Must be it. Yep,
that was it.
CAPCOM How about that?
AMERICA Okay, B is for Strofinhagle. Plus 173.
5.
CAPCOM Okay, got those.
AMERICA Okay, we'll torque at 30 10.
CAPCOM All right.
AMERICA 52 enter when I do an option. 1 to
the LOPC orientation. Okay? Let's see, 622 180 - that's
a pretty neat - that where I'm supposed -

END OF TAPE

AMERICA 9179316 outstanding. Okay, it's dark out there, and I think I could find a star if I had to.

CAPCOM Okay, I copied the angles for you, if you need them.

AMERICA Okay. It scares me everytime that light comes on. Ah ha, it went away. (garble) (garble) What the coarse align error is.

AMERICA Just barely in the sextant field of view.

CAPCOM Okay.

AMERICA (garble).

AMERICA Let's try DnoceS again. Pretty logical for this attitude. But we didn't need your -

CAPCOM Okay and the angles I called you last time, we're 217 on the shaft and 33 on the trunnion.

AMERICA Just in the sextant again.

AMERICA Looks like 217 33 is going to be it once you get it in there. I'll settle for that. There's old coarse align there. I'll let you copy those down there, I don't want them up here.

CAPCOM Okay.

CAPCOM And you can torque anytime.

AMERICA And let's see - okay, we'll torque at 34:30.

CAPCOM Okay, that's a good number.

AMERICA Ah ha, knows exactly where it is, okay.

CAPCOM Isn't that amazing?

AMERICA Yeah.

CAPCOM And it shows we even know how to calculate the burn attitude.

AMERICA Yeah, that's good.

AMERICA Okay, CMC link 2.

AMERICA Okay, here we go.

CAPCOM And, Ron, I just noticed that in all our scribbling, I missed the line that said configure for the dump on the previous call about 23, I don't know if you saw it in there or not.

AMERICA I missed it. I'll sure get it.

CAPCOM And when it's convenient for you I've got -

AMERICA Okay -

CAPCOM - couple of hydrogen tank fans to change and the good docs would like to hear how you're eating and pushing pills.

AMERICA Okay. Took a seconal last night, and by the H2 fans.

CAPCOM Okay and that's hydrogen tank 3, fans OFF and hydrogen tank 1, fans ON.

AMERICA Okay, number 3 went from AUTO to OFF, tank 1 is going from OFF to ON.

CAPCOM Very good.

AMERICA Let's see, I got that done - at 40, next thing we got coming, huh? Okay, I'll go down there and get some of this stuff configured. Oh, I ate just about everything

APOLLO 17 MISSION COMMENTARY 12/14/72 09:24 CST 180:31 GET MC-719/2

AMERICA yesterday, and then some other things and
a bunch of extra stuff too, so when I get a chance, I'll call
that down, okay?

CAPCOM Sounds fine.

AMERICA Get ready for this urine dump.

AMERICA Heater so.

END OF TAPE

APOLLO 17 MISSION COMMENTARY, 12/14/72 09:34CST 180:41GET 720/1

CAPCOM And Ron we're coming up on dump time and don't forget we want to close the covers and that kind of good stuff before we start the dump.

AMERICA Okay EV cover is - Let's see - EV is off. IR is off. That's yeah, I started an old fuel cell purge here. (garble) fuel cell purge. Now let's see, waste - Okay. Waste water dump is on. Mark zero.

CAPCOM Okay.

AMERICA GARBLE valve is dump. Battery vent is closed.

CAPCOM Okay, Ron the EECOM calculated about 12 minutes to go on your dump and it wouldn't hurt to set your kitchen clock or whatever you do to help remind yourself because that'll be after LOS. And we've taken a look at all of the systems and everything looks pretty good there and RETRO would like to remind you that the weight has changed on your trim pad and that has some implications to the way that computes the burn arcs and you want to be super precise and looks like everything is go for a trim.

AMERICA Okay, sounds good. I'll set my little ding ding here for about 10 minutes.

CAPCOM Why don't you try about 9? Charlie swears it's no more than that.

AMERICA Okay.

END OF TAPE

CAPCOM Oddly, Charlie.
AMERICA Want me to configure the DSE are you
going to set it up for me?
CAPCOM Why don't you do that one.
AMERICA Okay.
CAPCOM Come in Ron. We've got about a minute
and a half to LOS and I never did give you a summary of the
EVA - just a few quick particulars. They got 7 plus 15 on
EVA 3. Got almost everything done. Had to delete station
10 in order to make up time but that's made up for by the fact
that they found some more interesting things at other
stops. And there was - I mention the datelets, and there's
some indication that they may have seen that - a dike or
something of that nature over on the North Massif. And
Jack went out and applied all his - his physical skills to
the lunar surface gravimeter and that included jumping and
kicking and pounding and it still doesn't work.
AMERICA (laughter)
CAPCOM Guess we'll get them up about 183:45
and the only thing we've had to do on their surface checklist for
launch day is just to scrub the P22 that was in there and
we're just going to drop that one to make up some time.
And it looks like they ought to get about 8 hours sleep
out of it so looks like everybody is in good shape. And
you've got just a few seconds to LOS. Keep you eye on -
(garble) water and we'll see ya.
AMERICA There it is. Good, but - thanks Ken.
PAO This is Apollo Control. We've had loss
of signal from the spacecraft America, going behind the Moon
and nearing the end of revolution number 47. Now ground
elapsed time of 180 hours 56 minutes. Two hours 48 minutes
remaining until Cernan and Schmitt, aboard the lunar module
Challenger, awakened at Taurus-Littrow. And approximately
48 minutes until America comes around again, coming up on
two maneuvers. Spacecraft communicator, Ken Mattingly, read
up the PAD's or the data needed by the command module pilot
for performing these maneuvers. The first is a trim
maneuver to tune up the command module orbit, prior to the
lunar orbit plane change maneuver. The trim maneuver will
be done on the back side of the Moon when we're out of
contact with the spacecraft. That trim maneuver is scheduled
at 181:34:01 or 181 hours 34 minutes 1 second ground elapsed
time. Total velocity change in posigrade - 9.2 feet per
second. Burn time RCS - that's with the reaction control
system engine - 30.06 seconds and as Mattingly mentioned to
Evans, it's being done in so called minus X direction. In

PAO other words the spacecraft will pitch over engine bell forward toward the direction of flight so that Evans will see where he's been instead of where he's going. And the RCS thrusters will fire forward so that the instruments in the SIM bay will not be damaged by the exhaust plume from the rearward firing engines. The effect is the same, however the spacecraft's performing the maneuver in a pitched over attitude and actually 180 degrees away from the original land direction. On the next front side pass, then, following that the scheduled lunar orbit plane change maneuver putting the command module America back into proper co-planer path with the landing site for rendezvous later today. This maneuver is scheduled at ground elapsed time of 182:33:53. Total burn time on the SPS engine of 20.07 seconds, for a velocity change of 366 feet per second. This a burn that will force the plane of the orbit back to coincide with that of the lunar module as it makes its ascent from Taurus-Littrow back into orbit for the rendezvous sequence. The orbital measurements after the trim burn will be 67.3 nautical miles apocynthion by 62.4 at pericynthion. The plane change maneuver has also some retrograde component in it. A very slight retrograde component, which will circularize the orbit at 62.7 nautical miles. At 181 hours even, this is Apollo Control.

END OF TAPE

PAO This is Apollo Control at 181 hours 39 minutes ground elapsed time. Some 37 seconds now until the spacecraft, America, comes from behind the Moon on revolution 48. One of the first items in business on this pass will be a report by command module pilot, Ron Evans, on the trim maneuver, which he will have completed just prior to acquisition on this rev. Two hours and 4 minutes remaining in the Challenger crew sleep period. Waiting now from word from network that the - We've had acquisition now. We'll stand by for the initial calls.

AMERICA Ah, Ha, it looks like we're getting you already.

CAPCOM Hello there. How's it going?

AMERICA Okay. just now calling the VERB 82. It's 67.4 by 62.8. Okay, let me give you a little burn report here.

CAPCOM All right.

AMERICA (garble) reading on the burns, so you can get that off the recorder.

CAPCOM Okay.

AMERICA Let's see. Okay, with 30 seconds of burn time, by my stopwatch there, I ended up with a plus - no, let's see - with a minus .5X. I think 0 in Y and a plus .5 in Z. Okay, so I tweaked out the plus X and roll right 90 degrees and burned a .6 in a plus Y. Okay, with final trim of - on a 985 0 plus .1 and a minus .1. Delta V C was a minus 110.4 but we have that - not a minus, a plus 110,4. But there's no bias check at a plus .9 on the bias.

CAPCOM Okay.

AMERICA Okay, the NOUN 20 values - 920 values - after the 90 degree roll, there and through the final trim, were 270 179 317.

CAPCOM Okay, sounds like you're way ahead of the game.

AMERICA Yeah, worked real fine.

CAPCOM Have you had a chance to get anything to eat yet?

AMERICA Yeah, I ate some scrambled eggs and I'm doubling out the bacon bars, and I had a orange juice.

CAPCOM Okay, I wasn't trying to fish for a report, I was just trying to find out if you were still eating or (garble).

AMERICA (Laughter). I'm a little - I'm still eating a little bit. But we're in good shape.

CAPCOM Okay. You get a - you get a medal for not overdumping the waste water tank.

AMERICA Yeah, it's amazing.

AMERICA The old 9 minute mark was right on. I set it at 8 minutes, just to be sure, and 1 minute later it was tit for tat. Tell Charlie (garble) right there.

CAPCOM (Well, we won't be able to talk to Dumis again.

AMERICA (laughter) That's right.

CAPCOM Okay, and I don't (garble).

AMERICA (garble).

CAPCOM Yeah, Okay. And I don't know if you've got an explanation on why your angles changed for the P20 business after the burn but this - this plane change burn is going to have a little orbit shaping in it as well as the previous one. So that it - it is going to have some components that are both radial and tangential.

AMERICA Ah Ha. Okay.

CAPCOM So that meant that your REFSMMAT wasn't quite the REFSMMAT that you were anticipating earlier. And that explains the - why those angles had to change on you and also explains some of those odd ball components.

AMERICA Okay. Okay. I was wondering about that but - I'll tell you - those guys in the trench down there knows so much more about what's going on when they calculate that stuff than I do that I'll - I'll believe them.

CAPCOM Say, Ron, are you - are you in a place where you can spare a minute or two? Is it convenient?

AMERICA Sure.

CAPCOM Okay. Got somebody that would like to talk to you for just a minute.

AMERICA Oh, yeah.

FLETCHER Ron, this is Jim Fletcher. How are you?

AMERICA It is - Dr. Fletcher - mighty fine, Sir.

FLETCHER We had hoped to catch you last night but you were behind the Moon when the ceremony was going on. Did you catch any of it at all?

AMERICA Well, I - I got the briefing on the report from it from the CAPCOM but it sounds like it was a mighty fine ceremony and something that this nation can really be proud of.

FLETCHER Well, Ron, there's one thing that the President wanted to make sure that you got. And I had hoped to do it last night. We've been in very close touch with the Whitehouse and the President has been following closely what - what's going on up there and of course, it's absolutely fascinating to us down here. But he wanted to be sure that you understood that he'd like to wish you

FLETCHER God's Speed as you return to Earth.
And I must say I'd like to add that and also add that,
from everything I've heard, this is a spectacular success.

AMERICA Thank you very much, there, Dr. Fletcher,
and please convey my thanks to Mr. President. I appreciate
that very much and I also appreciate the opportunity to be
able to do something for my country and I - hopefully this
is the one thing that I will be able to do. And I certainly
appreciate it. Just the thoughts, themselves, really.

FLETCHER Well, very good, Ron. I'd just like
to say that I've never - I've never had any idea what so
ever that things would go so well in the scientific part
of the orbital science. It's - it's almost unbelievable
when I talk to the guys in the back room and I just wanted
to make sure that you knew that I knew it.

AMERICA Yes sir. We certainly do and they
worked real hard to get the - these experiments and the
equipment all squared away. I was following along with
them pretty well and I had lot of confidence.

FLETCHER Well, very good. Thanks kindly.

AMERICA Yes sir, Dr. Fletcher, and I appreciate
it.

CAPCOM And Ron, how about high-gain.

AMERICA Okay, let me reset it here.

PAO That was NASA Administrator, Dr. James
C. Fletcher. He was passing along a similar message to the
one that he spoke to the crew in Challenger on yesterday
while Evans was apparently behind the Moon, or at least
out of contact on that particular circuit.

END OF TAPE

CAPCOM And how about auto on the high gain when you get a chance.

AMERICA Okay, I'm right there so we've got her.

CAPCOM Okay, and let's see we've got a few minutes. I had two more magazine changes to go into the flight plan if it's convenient to give them to you now.

AMERICA Let me get started on the other VERB 49 here, okay?

CAPCOM Okay, just fine.

AMERICA 315. Plus enter - plus add one more proceed. Okay, we're on our way.

CAPCOM Okay, Ron, just for your information about 291 looks like the maximum yaw you ought to see on this one. We'll keep an eye on it for you.

AMERICA Okay. 203. Okay, why don't we take some of those flight plan changes here?

CAPCOM Okay. And these are real simple ones on page 283.

AMERICA 283. That's really looking ahead. Okay.

CAPCOM Okay at 187 45 you've got a magazine Bravo Bravo called out and we'd like to make that Delta Delta.

AMERICA Delta Delta it is.

CAPCOM Okay, and a couple of lines below that you have a magazine November November which we want to change to Kilo Kilo.

AMERICA Kilo it is.

CAPCOM Okay that was kind of painless wasn't it.

AMERICA Yeah, that was.

CAPCOM And that's all I've got. We want to remember to get the PU valve to decrease.

AMERICA Yeah, I can do that now, I guess, couldn't I.

CAPCOM Okay.

AMERICA Okay, we're setting on the minus 200 degrees.

AMERICA Put a time here and let me yak. Bring you up to date on the - hookup.

AMERICA Okay, ready to go with the food?

CAPCOM Yes sir.

AMERICA Looks like we're going to miss it.

AMERICA Okay, today sausage, grits, fruit cocktail, orange beverage, coffee and tea and a vitamin. Lunch box, ham - couldn't find my cheese until last night so I didn't have it. One rye bread, can of peaches or sack of peaches, cereal bar, orange drink, coffee, graham cracker cubes, apricot cubes, jelly candy, sugar cookies. Supper - had hamburger and catsup, vanilla pudding, grape drink, I guess that was it.

CAPCOM All right, sir. We've got about 34 minutes or so until the burn. I've got a news summary I can read if you'd like to have that or put it off until later I can do that too.

AMERICA No, why don't you go ahead.

APOLLO 17 MISSION COMMENTARY 12/14/72 10:42CST 181:4(GET 723/2

CAPCOM I'll just read it and if I start to bother
you why just holler at me and I'll stop.

AMERICA Okay.

CAPCOM This is put together by Mr. Jim Kotowsky and
it looks like he's done a pretty nice job of summarizing the news
so I'm going to read it cold. And he's given us a summary of the
late news. And the weather couldn't be worse in Houston. It had
to be better on the Moon or in orbit around it. This morning
more cold and drizzle blanketed the Houston metropolitan area.
Yesterday morning it was 32 degrees. This morning a little warmer
but a lot wetter and it's getting colder on Friday. On the
National International scene peace talks in Paris between
Dr. Henry Kissinger and Le Duc Tho have ended - at least for the
time being. Dr Kissinger is in Washington today to brief Presi-
dent Nixon on the talks. The past 3-1/2 weeks the pair of nego-
tiators have held 58 hours of talks. Neither side is getting -

END OF TAPE

CAPCOM - - (garble). Neither side is giving out any hints. When asked about the cease fire by Christmas, Dr. Kissinger told reporters, at Andrews, I don't want to make any predictions. The U.S. by sizable vote has had its assessment to the fund of the United Nations reduced by a vote of 81 to 27. The U.S. will now pay only 25 percent of the cost rather than the present, 31 percent. Transatlantic fares may drop beginning in February. The International Air Transport Association says all carriers will set their own prices. It appears that air travelers to Europe next year may get some real bargains. In the hotly contested and Federally supervised United Mine Workers election the inserted candidate, Arnold Miller has gone into a lead over incumbent President Tony Boyle. Miller has lead a grass routes movement to ask Boyle to lower the union control from the late John L. Lewis. We mentioned the rather dismal weather in the Houston area this morning. The midwest and north-east are really getting some bad weather. Ice storms seriously hampered the northern part of the Nation, from Idaho to the eastern seaboard. After almost a year, troops involved in the India, Pakistanian War, are beginning to go back to their homelands. Truce-line maps have been exchanged and approved by both governments. Civil servants of the European common market they're called Euricrats are on strike. Eight thousand employees walked off the job due to a salary dispute. On the regional and local scene, the Houston City Council has vetoed a plan to build a new commuter air strip in southwest Houston for the Stol aircraft. Residents of the area have been protesting it. A community of Tomball north of Houston, is looking for a new Police Force. The Police Chief and 7 officers walked off the job Tuesday, after the City Council refused the officers a pay-raise. In Harris County, the State Highway Patrol and reserved police have been called in to maintain police protection. That's maintain protection in Tomball. The project to expand the- expand the Armand Bayou as a park and wildlife refuge has been given a boost with a 100 000 dollar pledge. So far \$350 000 has been pledged and \$750 000 is needed to gain Federal matching funds. Galveston will hold a school bond election on February 3rd. The bonds if okayed, will be used to aircondi- tion all schools not so equiped and to improve lighting in schools. The late thing in sports, the Head Coaching Job for SMU is open, being considered by North Carolina Coach Bill Dooley, and Washington Coach Jim Owens. George Blanda, a living testimony for the over 47 will become the oldest man ever to play football this Sunday, prior to Blanda, I guess, we've had some other folks, but this ought to be a new record. In Pro basketball, Houston didn't play

CAPCOM last night. Currently, Baltimore, Boston, Milwaukee and Los Angeles lead the divisions. In pro hockey, Alberta beat the Houston Arrows 3 to 2. The big news in Houston Sports is City Council's approval of The Greenway Plaza as a site for the 10-1/2-million-dollar sports arena. And finally in - Christmas Shopping is in full swing. Christmas trees are in tents, on street corners and super market sites all over the area. Private homes throughout the whole area are lighting up with decorations ranging from Happy Santa Clauses in sleighs to Nativity Scenes. It will be a Christmas World waiting for you when you come home. And that ends our summary for this morning.

AMERICA That's a good summary, appreciate it. Little bit of everything in there.

CAPCOM Yeah, it looks like Mr. Kotowsky read a lot of newspapers there.

AMERICA (Laughter)

CAPCOM Okay, Ron. We're picking up some thermal problems on the pan camera would you manually roll left to 30 degrees and we'll hold it until we've passed - you know the terminator - across the terminator.

AMERICA Okay.

CAPCOM And Ron, that terminator crossing comes fairly close to the burn, so you might think about - if it looks agreeable to you, just go ahead and we'll use that as the burn attitude. You'll have to get a new P40 trim to take care of the gimbal offsets. So you may see a slight pitch and yaw attitude change.

AMERICA Okay, that's no problem. I'll just roll that and then use a P 41 trim.

AMERICA It's - It's on command to make that 90 degree roll the other day, or just awhile ago. And if you hit your stick a little too hard you really wrapped it up to a little better than a degree a second. So, you can really get a good sensation to roll, especially when you can see the Moon.

AMERICA How's that? Pretty good attitude?

CAPCOM Looks like we'll have to go a little bit further. Why don't you give us 5 or 10 more.

AMERICA Okay, I didn't let go of the stick -

CAPCOM Ah, you're learning our tricks, aren't you.

AMERICA (Laughter) a teacup of gas there.

CAPCOM Okay, now - now you're in good shape.

AMERICA Okay, we'll stop it right there, then. About 35 degrees or so.

APOLLO 17 MISSION COMMENTARY 12/14/72 CST 10:53 GET 182:00 MC-724/3

SPEAKER Anything, to make you happy.

AMERICA Okay. I just made a DELTA V check while ago and it was minus 22.2, Bias check was a mi - let's see a 100 to 100.9 in a minute and 40.

CAPCOM Okay.

AMERICA Pressure rate 2 auto RCS, little light. NZ, okay, we'll turn on 6 (garble)

END OF TAPE

AMERICA (Garble) for the Delta VC. Okay, SIM bay, I checked it a while ago, BMAGS are Rate 2, auto RCS selects are okay. Okay (garble) 7416, that's pretty good. Okay plus .38 and a plus .92 that's all right. Okay verify. Close my own I guess it looks like, don't I.

CAPCOM Yes sir, when they gave you the uplink, they had to put in the trim burn.

AMERICA Yeah, that's right. Plus 180 2, enter, plus. 182:33:53 (garble).

CAPCOM Looks good.

AMERICA That's all right. 25, enter, okay 981 15.9 minus 17. Okay Y is a minus 365.5. Z (garble) minus 9 enter. Okay 17.9, 365.5 minus 6.9, proceed.

CAPCOM Okay, they look good here.

AMERICA (cough) Okay.

AMERICA The computer thinks we're going to be circular, 63.0 by 63.0, of course that's impulsive I guess. 366.0 for total, that's right. Okay 19 (garble) DET. Okay I got the DET going. I think my sextant star check's not going to be any good here.

CAPCOM Okay, we can give you another one here if you'd like that.

AMERICA (garble)

CAPCOM They been scurrying around here, and got you some new numbers.

AMERICA I don't see any reason - oh really, I'll do it just for the heck of it.

CAPCOM Okay, -

AMERICA Got time here - let's see 19 minutes -

CAPCOM Okay -

AMERICA (garble) I'll just let you read them to me as I get (garble) -

CAPCOM All right, sir, it's a shaft of 237.2, when you get there.

AMERICA Okay, plus, what did you say it was -

CAPCOM 237.20.

AMERICA Shaft? 237.20 ENTER. Okay. Trunnion?

CAPCOM Okay, that's 27.480.

AMERICA Okay, (garble) CMC hope it's the wrong calculation, (garble).

CAPCOM Okay, well we're off in roll -

AMERICA What star's it supposed to be -

CAPCOM - by a degree from where we calculated it.

AMERICA Okay.

CAPCOM It's supposed to be good old star number 22.

AMERICA (garble) telescope. Hey, there it is.

CAPCOM Okay, your (garble) to the right roll angle so it -

AMERICA Okay, yep, that's it.

CAPCOM Okay.

AMERICA Outstanding.

AMERICA Okay, VERB 37 enter 00, enter.

APOLLO 17 MISSION COMMENTARY 12/14/72 11:03 CST 182:10 GET MC-725/2

AMERICA direct to high manual. (Garble) Okay. -
these things up for a minute. (humming) (cough) 358 314, that didn't
change very much. Okay. Okay, it says we're there. Set IMU.

AMERICA Wrong pitch. Acts just like the simulator,
you can't tell, I thought when you got the spacecraft that
if you're 180 (garble) it's supposed to flop back and
forth, but it doesn't do it. Okay 326, 357.5 and about 315.4
C align is GDC.

END OF TAPE

AMERICA (Cough) Okay - It's easy to see those lines - staff control. Direct RH breakers are going in. Pitch 1 and yaw 1. Okay all control and SPS breakers are in. Manual attitude RATE COMMAND. Okay looks like about deadband man rate to log is in rate command. GARBLE. Gimbal drive is in AUTO. We're down to a 6 minute check. Okay, we won't have any manual starts on this one. Not restarted if it quits, we'll set them down in burn time plus 1. BGY only. Back to zero and that's pretty GARBLE, I guess. All axis - Y and Z just a little GARBLE. Okay, we scratched out the part - we're going to turn the tape recorder on, right?

CAPCOM Yes sir.

AMERICA Okay.

AMERICA At 12 seconds for ullage. Burn time was 20 seconds.

CAPCOM Okay, and you're go from this end.

AMERICA Okay.

AMERICA Okay, refresh my memory on the mission rules there, Ken, could you - if it doesn't start on back A - do we start on back B?

CAPCOM Standby - we're making sure we're going to tell you the right thing, or not.

AMERICA Okay. I was a little confused about the manual starts - that's not a manual start to me though.

CAPCOM Okay, Ron the rule says if no start on A try B.

AMERICA Okay, that's what I thought. (Humming)
Plenty of battery juice here. Let's go to A on - B is on and coming up - okay, 253. Pressure is all right in 2A and 2B is okay. And helium valves are in AUTO, we're in decrease and the oxidizer flow valve hooks mode is primary. Primary decreased to normal. Okay. That's a lot of work. I'd like to get strapped in a little bit here -

END OF TAPE

AMERICA Okay (garble) now I've got the crazy tape recorder. Command reset here we go. Okay huing valve, did that, turbo power 1, okay, 2, that's EC directs are off B mags are uncaged - okay no hardovers, go to SCN Head controller number 2 is armed. Okay pitch 1, got it; yaw 1, there we got it, okay, trim is about 70. Yaw is .9, pitch is kink kink kink. Okay we have the trim, okay my computer returns to zero, GAC clockwise no mic to vic. Okay pitch 2, got it; yaw 2 got it, ah ha, we have the trim plus .00 and plus plus minus, okay, give it back to the computer. No mic to vic. Okay, 3 minutes to go. Okay on the AC thumb dregs KGO are on B mags key release, proceed for the final trim, got a 618. D18 says we're there. Okay, we'll enter that 204, do you want a gimbal test option. Yes. 1 2 minus 2 0, plus 2, minus 2, 0 3 4, okay, we have the trim with 3 minutes to go. Okay limit cycles back off. In that burn we'll right to high. (cough) DET looks good, we've got a 20 second burn. Shut down on 21 seconds. Delta V at stand by have CMC GDC incubator little cycle OFF; dead band rate to high; transpatrol power's off. (garble) are both off, GMC auto. Okay, there we go missed one, that one rate 2 on the old mags. Rate command all 4 gimbal motors are on. We're (garble) of CG. (garble) logic do this roll, roll Alpha S-IVB. Pitch is AUTO, DET is working, armed, armed. Okay at 16 auto RCS select is ON, circuit breakers are still good. (humming) Okay I'm waiting for 30 seconds when all the normal transcontrol power to Delta V thrust A switch. M is to G, M is to normal transcontrol power is on and Delta V thrust A is on. Okay 4 jetts 12 seconds. (humming) Okay we have ullage. Okay 6 99, proceed 3 oh oh there we go we got ignition about 87, okay number 2 is coming on we're up to 90 on the Delta V-C. Okay 9 13, looking good, okay roll air is off, that's all right we're done, 3, 1, shutdown automatic. Okay minus 9.5 on the EMS okay 366.8 let's proceed to stop the rates here. 6.8 okay, man look at those 85s I'm a little bit off, but that's good. Okay pitch 2, got it, yaw 2, got it, and number 1, got it, number 1, got it. Okay servo thrust is OFF. Well let's see I've forgotten what it feels like, ha, that's pretty neat. Okay, that was okay. Somehow we got a .3 in there. That's an X anyhow, Y is 0 that's what I want, Z is all right, so we'll just leave it that way. I'll proceed with the changes again. That just changed to - Okay 00 enter, okay VERB 6 NOUN 20 enter, Okay, I presume you're reading the DSKY, haven't you been, Houston?

CAPCOM Yes sir.

AMERICA 3. The time as near as I could tell was pretty good. With (garble) X, what did I say 366.8, I think. Delta V-C is minus 9.5; bail off is 11 percent 12 to - Okay, let's get some more switches off Transcontrol power okay locked, locked; transcontrol powers are OFF dregs are OFF, direct ullage circuit breakers are open pitch and yaw

APOLLO 17 MISSION COMMENTARY 12/14/72 11:20 CST 182:27 GET MC-727/2

AMERICA are OPEN. Okay EMS function is OFF.
We'll just stand - Rate 2, we'll come and get the bus ties.
Hey that was a neat burn. (cough).

CAPCOM Feels more like an air plane, that way,
doesn't it.

AMERICA Yeah, it was kind of like an after burn
that time. JA bat (garble) AC is OFF; EC is OFF. Not
too bad, okay, we're on Main A. Must be --

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/14/72 11:30 CST 182:37 GET MC728/1

AMERICA Oh, oxidizer. is .6, fuel is 28.4
(garble) the balance is minus - now, let's see - about
460, I guess. Thing going in the right direction?

CAPCOM We don't think the pugs really ever
stabilized.

AMERICA I don't think it did either. Gee,
AC roll switches are off now.

CAPCOM And Ron, we're ready to give you some
new stuff in the computer whenever you're - pass by and
give us ACCEPT.

AMERICA Okay, you have ACCEPT. We've done that
on through the post SPS. (garble) cue card.

CAPCOM Ready?

AMERICA And we almost forgotten how that thing - kicks
you in the seat of the pants. I guess I must have been
floating off the seat a little bit more this time than I
was on the rest of the burns. Okay, pan camera power is
OFF and logic power should go to deploy retract. Okay,
that is A, that is B. Deploy and retract. Meant to inhibit all
jetts. Okay, we'll inhibit the - all except the roll right
now. On - Okay - off. I'll just inhibit the roll 1,
Delta 1 and then I start the - yeah, I guess - DAP now.
You through with the computer?

CAPCOM Okay, we're through. It's your computer.

AMERICA Okay. And - (garble) 2 are on - off now.
Camera laser altimeter open. Barberpole in the gray.
20 enter. 22 enter 5 enter, plus X SIM bay (garble). 2.25 to
enter we are going to use a 2 1/2 degree deadband this time. 50
is around the Moon. Okay. 276 plus 2 (garble). Different
attitudes. Now we'll go make a cup of coffee.

CAPCOM Ron, I've got your pan camera photo pads
when you're ready.

AMERICA Okay, set to be ready to copy.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/14/72 CST 11:40 GET 182:47 729/1

CAPCOM AT starts 183 4841, T stop 1840643.
AMERICA Okay.
AMERICA Okay, I'm just now remembering one of
your comments from 16 that we didn't get done on this extra.
Comm carrier cloth - there's cloth area you know.
CAPCOM Uh huh.
AMERICA If you need any extra electronics, we
sure could use another cloth hat.
CAPCOM Oh, you can wash it off. You probably
do that inadvertently.
AMERICA I already have. I didn't wash it with the
right thing though.
CAPCOM I was wondering if you would own up to
that. Hey, the good Doctor over here says that your traces
are flat lines - thought you ought to be aware of that.
AMERICA Oh, they are.
CAPCOM You feel okay?
AMERICA They're kind of itching it - they're
kind of itch - yes, I'm okay, but they're kind of itching
anyhow. I feel like I ought to change them so -
CAPCOM Okay, that would really make him happy.
AMERICA No wonder they're flat lines - it's un-
plugged.
CAPCOM Okay.
AMERICA It's (garble)
CAPCOM Alrighty, we're about 4 minutes from
LOS and all systems have been looked at and they're all look-
ing okay so guess we'll see you on the other side.
AMERICA Okay, how's my stuff, now? I got plugged
in.
CAPCOM We don't see anything yet.
AMERICA Didn't huh.
AMERICA Well, I needed to change them anyhow so -
CAPCOM Okay.
AMERICA I'll try to -
CAPCOM Looks like you hit something there when
you did that.
AMERICA I was just shaking my coffee.
CAPCOM I tell you it sure put life in the
signal.
AMERICA It did?
CAPCOM How are those binoculars working out?
AMERICA They're working real good. I find I
have a bit of a problem holding them still though.
CAPCOM Yes, they're about the max magnification
I think, that you can handle.
AMERICA Yes.
CAPCOM Have you tried looking in earthshine at
it and see if you can pick up anything there?

AMERICA Yeah, and they just don't quite look as - let enough light through, I don't think in Earthshine. You can see better with the naked eye, but they don't let enough light through the binocs to enhance your image capability at all.

CAPCOM Alright, I was curious because I notice in the dark shadows in the daylight side they did bring out things that you couldn't see with the naked eye. I guess that's contrast that does that.

AMERICA Yeah, I noticed that too. Yeah, you can look down at the shadow of a crater where you got the sun down there, but if you have more back lighting or something. You know but you can see that pretty good with the naked eye anyhow. Earthshine, now, about all I can get out of Earthshine, really, are different albedo. And you can get some textural, well, not so much textural difference, but the terrain, bumps and humps and and flow-fronts and see craters you know.

CAPCOM I wish I was there with you.

AMERICA I tell you I had no idea how interesting and how much fun it would be. After the first day and I finally got over the, I guess you could - I don't know, you call it the effects of adapting to zero g or something. But you are just a little bit woozy, you really don't feel like doing a heck of a lot the first day up. So it's good that the first day is kinda ---

PAO This is Apollo Control. The Command Module, America, passing behind the Moon on the end of the 48th lunar orbit. 48 minutes until the crew of Challenger is awakened at Taurus Littrow. During the just completed front side pass the Command Module Pilot Ron Evans completed the lunar orbit plain change maneuver which went nominally on time with velocity change of 366 feet per second using the service propulsion system engine. Just prior to that before he appeared on the front side of the Moon a small trim maneuver was performed using the forward firing reaction control system thrusters. This maneuver was to trim up the orbit. Some dispersions that had grown during the lunar orbit period that America has been in motion about the Moon. The Gold Team of Flight Controllers is handing over at the moment to their replacements after about a 12-hour shift. The oncoming team is the White Team of Flight Controllers headed up by Eugene Krantz. There will not be a change of shift press briefing of the off going shift. 47 minutes to wake up of the surface crew, Schmitt and Cernan. And at 182:57 this is Apollo Control.

END OF TAPE

PAO This is Apollo Control at 183 hours 32 minutes. We're about 14 minutes away from the scheduled wakeup time for Apollo 17 - the lunar module crew, however they beat us to the punch this morning and we just got a rousing rendition of "Good Morning To You" sung by the crew of Gene Cernan and Jack Schmitt on the lunar surface. The Surgeon reports that the two crewmen appear to have gotten a good nights sleep - 6 to 7 hours, and we'll pick up with the taped replay of that Good Morning rendition from the crew and then follow it live. (music)

CAPCOM Good morning Challenger and thank you for the vocal rendition from the Moon there.

CHALLENGER Well, we thank you for your kind music. We wanted to let you know we were thinking about you this morning, Gordie.

CAPCOM You just beat us to it, but -

CHALLENGER That was a great song.

CAPCOM Decided to play it anyway, cause it was such a pretty selection.

CHALLENGER I think it's very apropos at the moment. I guess I can just wait for "Hail Purdue", huh?

CAPCOM Yes, just standby, you'll probably hear it before you get back.

CHALLENGER Hey, we've been stirring for about 15 or 20 minutes, we're in the midst of a nice hamburger omelet, (laughter) and assorted accessories. As a matter of fact, it's all over us. And if you'll give me 5 minutes, I'll be ready to go on the PNGS, unless you want to start at center.

CAPCOM Okay, no hurry, finish up and get cleaned up there, and the only change, we have some change in the timing as far as the checklist so we can gain back the time we're behind now, which is actually less than an hour. And the only hardware change other than deletions is that we'd like you to leave Demand Reg A closed at all times. So whenever you come across a place that says OPEN at cabin or egress, we'd like you to leave it closed.

CHALLENGER Okay, Gordie. We've got you on that. And Gordie, could I have a quick status report on America and Challenger?

CAPCOM You bet. America is just as good as gold just like always. Ron got off the trim burn on the backside followed by a good plane change on the front side. In fact he - G&N cutoff was a tenth or less in all axis. Didn't even need to trim it. So, he's in about a 62-1/2 circular, I believe, and waiting for you to come up and join him.

CHALLENGER Okay, how's his consummables?

CAPCOM Stand by.

CAPCOM Okay, America's consummables are great and so are yours. There is a possibility we may have to switch to ascent water just prior to liftoff. Everything really is in good shape.

CHALLENGER Those are good words, Gordie. Thank you.
CHALLENGER Hey, Gordie. In honor of one of your
comm handovers last night, and in the tradition of Apollo 8,
I've got paraphrase of a familiar poem for you.
CAPCOM Okay, go ahead.
CHALLENGER Well, it's "The week before Christmas and
all through the LM, not a Commander was stirring, not even
Cernan. The samples were stowed in their places with care,
in hopes that with you, they soon will be there. And Cernan -
Gene in his hammock and I in my cap, had just settled our
brains for a long - short lunar nap. But out - up on COMM loop
(garble) there rose such a scatter, I sprang from my hammock,
to see what was the matter. The sun on the breast of the
surface below gave the lustre of objects, as if in snow.
And what to my wandering eyes should appear, but a miniature
Rover and 8 tiny reindeer. And a little old driver so lively
and quick, I knew in a moment, it must be St. Nick. I heard
him explain as over the hills he did speed. Merry Christmas
to all and to you all God speed.
CAPCOM Very good.
CHALLENGER Gordo, that was the first time I heard
that and I've got to say that was beautiful.
CAPCOM I agree. Did the LMP get any sleep or
did he spend all night composing that?
CHALLENGER People always said we ought to have a
poet in space.
CHALLENGER I don't think we've made it yet.
CHALLENGER No, for some reason I really woke up
with one of your handovers last night, and that was how I
went back to sleep.
PAO That poetic offering was from Jack Schmitt.
CHALLENGER (garble)
CAPCOM Rog, Jack.
PAO We're about 15 seconds now, from re-
acquiring America in its 49 revolution of the Moon.
CAPCOM Challenger, Houston. One update for the
postsleep procedure. I understand you brought in the LMPs
camera, and we want to be sure you get that into the jett
bag before the final jettison here, and by the way, you're
stay for that final jettison.
CHALLENGER Okay, Gordie, it's already in the jett
bag, thank you.
CHALLENGER Hey, Gordie, you might make some notes
that before I put it in there, I took another black and
white or black and white window pan with mag Nancy.
CAPCOM Okay, Jack, Roger.
CHALLENGER Gordo, on Reg A, that is - you determined
that is just a small leak by the reg?

END OF TAPE

CHALLENGER - small leak by the reg. And it would be useable if you had to.

CAPCOM That's affirmative, Geno. It's a small slow leak and it is useable if needed.

CHALLENGER Okay, thank you. It's coming up so far. I think that's all the system anomalies we've got, isn't it?

CAPCOM That's all I can think of at the moment. I do have revised times for the rest of the lunar surface checklist which at a convenient time I can give to you - so that you'll have a how goes it as you go on down the line here.

CHALLENGER Why don't you give them to us now Gordy.

CAPCOM Okay, turn to page 7-9.

CHALLENGER Go ahead.

CAPCOM Okay, 7-9 LGC IMU power UP, change that time from 183 04 to 184 10. The eat period time is now 184 20. Turn the page and the 183 59 above park rendezvous radar is now 185 05. Next page don suits at 185 15. Go to the next page. Prep for equipment jettison is 185 50 and the same page - helmet glove donning is 185 58. Next page pressure integrity check 186 04. Cabin depress 186 08. And hatch opening is 186 12. Next page 17-14, cabin repress is 186 15. Cabin cleanup for launch is 186 20. And on the following page we're going to delete the P22 but we'd like you to do all the procedures except those from VERB 95 ENTER through P00 ENTER inclusive - the center section of procedures, so you'll still be closing the rendezvous radar breakers going to LGC and parking the antenna and copy pad. Over.

CHALLENGER Okay, we're going to delete everything from VERB 95 through P00 into P22. That's the center of the page.

CAPCOM That's affirmative and then the next page cabin press for ascent is 186 45 and instead of 39 minutes we're going to have you do that in 3 minutes. And you should have a little more time than that, since you got up early. That puts you right back with the timeline, at liftoff minus 1 hour 15, at 186 48. Over.

CHALLENGER Okay, top at 7-15 where we pick up - we were going to do this again, you know, the P22. Have you got a time up there?

CAPCOM I guess we'll just have to work that in with cabin cleanup time. We had deleted that whole time block but you do have to catch those procedures.

CHALLENGER Okay, and in the times on the top of 7-10, for P22 are not applicable and I guess you can give us an update for our P57 liftoff time.

CAPCOM That's affirmative. That might be - there's a couple more changes coming at me here but let me make sure I've got them straight and I'll call you later. Go ahead with whatever you were doing.

CHALLENGER Okay.

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CHALLENGER Okay, Gordy, If I get ready for the LGC - I'll have you power up, I'll give you a call even though it comes earlier but I'd like to get that started - whenever you are ready to start it.

CAPCOM Okay, we concur with that.

CHALLENGER Hey, Gordy as far as the food, medication, and sleep goes - no medication, Gene had 5 hours of good sleep, I had probably around my usual 6 in spite of my poetic informations, and the food - we continued to do well, I believe, we've eaten a wet pack a piece last night. We got one this morning. We've eaten our scrambled eggs and sausage yesterday, and as we've run out of juices, and tea and which is somewhat of an inconvenience I might say, and if you've got any specific questions I can fill you in on it but I think foodwise we've done pretty well.

CHALLENGER Can you give us a feel on the fluid intake?

CAPCOM Well, that's what I was trying to do when I said we'd drunk all the juices and tea. Plus, Gene, in particular, takes water from the hose.

CAPCOM Okay, Jack, fine. Sounds good.

PAO This is Apollo Control at 183 hours 49 minutes. Gene Cernan and Jack Schmitt aboard Challenger on the lunar surface after having gotten up about 15 minutes early. Now having breakfast. They are a bit behind in the timeline but we expect to have them caught up by the time they - or about 1-1/2 hour prior to lunar lift-off, which is when we begin the really busy period of liftoff preparations, and everything appears to be going along very smoothly at this time. The crew's early arising caught us a little unprepared here in mission control we had our own wake up tune to play up to them this morning which was to be the - titled theme from the motion picture 2001 A Space Odyssey, however they beat us to the punch with their own wake up song to the control center and we'll play that back for you at this time.

CHALLENGER (Singing).

PAO And after giving us a few minutes to catch our bearings we hit them with the theme from 2001 A Space Odyssey, since then things have been going along pretty much normally. The poetic offering was from Jack Schmitt. He said it was for all the kids back home. It was his version of the Night Before Christmas. We have reacquired Ron Evans aboard the Command Module America and everything is progressing very smoothly aboard that vehicle. We're on separate communication circuits at the present time and will be up until the revolution prior to LM liftoff at which time we'll switch back to a single air-to-ground a single spacecraft communicator operation and be able to follow the operation in both vehicles simultaneously. That will be at acquisition of signal on the CSM's 51st revolution.

END OF TAPE

CHALLENGER Okay, Gordy, it's PGNCS Power up time.
CAPCOM Okay, Geno, and I've got a couple more items to completely cleanup the checklist whenever you can get to that.
CHALLENGER I'll let Jack give you a call. I'm going to start on the PGNCS when we're ready.
CHALLENGER Gordy, you ready for a PGN.
CAPCOM That's affirmative, finally got you a GO to status as per checklist.
CHALLENGER Okay there is the PRO I did get the restart. I got the no AT, the DAP, gimbal lock light and the program alarm light's on.
CAPCOM Roger.
CHALLENGER MARK that the gimbal operate breaker is closed.
CAPCOM Roger.
CHALLENGER That's the IMU breaker.
CHALLENGER Yeah. Stand by for a 96.
CAPCOM We ready for a Power amp primary and high bit rate.
CHALLENGER Okay. You got it.

END OF TAPE

CHALLENGER Okay, Gordo (garble) test is complete and it's GO, and I'll give you an E memory dump.

CAPCOM Okay, we're ready, stand by for it. And while it's coming, I could give you the updates for the next page.

CHALLENGER Okay, it's coming at you and you can go with the updates on the next page.

CAPCOM Okay, page 7-10 your P57 lift-off time, upper right corner is 188:01:4385, over.

CHALLENGER Okay, Gordy P57 lift-off time 188:01:4385.

CAPCOM That's affirmative and now we'd like you to delete all the steps below that lift-off time from the AT 3 data star info box through the VERB 32 after the last - after for the remaining data stars and after last star. In other words, just delete all between the box and up to circuit breaker AOT lamp open. And, of course, they're'll be no P22 time, over.

CHALLENGER Okay. Delete all the data star information. Between the start of that box and after last star VERB 34 enter 00 enter.

CAPCOM That's correct and then turn to page 7-15, we're changing - we - looking here a little closer we find that radar's already in good position so you can delete all procedures on page 7-15, except copy ascent PAD, CSI PAD and LM DAP weight.

CHALLENGER Okay, we deleted everything but the last 3 lines on that page.

CAPCOM Okay, on page 7-12, back up a couple pages, in the lower right corner there in the blank space, you might down 185:58, VHF check with command module, and that'll be according to the procedures on 7-15 in the box. You might just parenthesis 7-15 to remind you where the procedure is, but the comm check will come during that time when you're prepping for equipment jettison, or right around there.

CHALLENGER Okay, we got that.

CAPCOM Okay, that's all we got for you, and we have the E MOD dump okay.

CHALLENGER Okay.

CHALLENGER Gordy, we're in fluent data and we're standing by for your uplink, and how long does that AOT heater breaker have to be open? I pushed it in at 184:08.

CAPCOM Okay, I'll get an answer for that, and I think we'll be coming with the uplink here shortly.

CAPCOM Gene, no time constraint on that AOT breaker, except if it's foggy, it hasn't been in long enough.

CHALLENGER (laughter) Thank you Gordy.

CAPCOM Challenger, here comes your uplink.

CHALLENGER Okay.

END OF TAPE

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CAPCOM Challenger, it's your computer. You
have a stay vector a time increment and an RLS.
CHALLENGER Thank you, Gordy.
CHALLENGER Yeah it likes the - it likes the command
module's orbit.
CAPCOM That's good.

END OF TAPE

PAO This is Apollo Control with 184 hours 32 minutes. Jack Schmitt and Gene Cernan aboard Challenger on the Lunar Surface at the present time, are going through the platform alignment getting their guidance & navigation equipment ready for Lunar liftoff. They will also shortly begin donning their pressure suits. And they appear to be running about 30 minutes behind the timeline, however, we expect they will have adequate opportunity to make up the lost time prior to a Lunar liftoff. And, we're looking for liftoff to occur pretty much on time at 188 hours 1 minute 44 seconds ground elapsed time. This is actually about 1 minute, 10 seconds earlier than the preflight plan with the difference caused by the fact that the Command Module for a period of time, was in a slightly smaller orbit than had been planned pre-mission. With the plane-change and orbit circulation maneuver performed a few hours ago by the Command Module, that orbit is now back on the planned trajectory. However, because of the smaller orbit, the CSM was in for a period of time, the liftoff time of the LM has had to be moved up 1 hour 1 minute 10 seconds, to put the LM in the proper position with respect to the Command Module, for their rendezvous. This is a so-called phasing consideration for the Lunar liftoff. Again lift off currently planned for 188 hour 1 minute 44 seconds or about 1 minute 10 seconds earlier than called for in the flight plan.

Ron Evans aboard America is involved in scientific activities at the present time, getting set up for Zodiacal Light photography. Everything continues to go very smoothly aboard America. Evans a little while ago hooked up the inflight vacuum cleaner and powered it up to see if it was going to work. That piece of equipment will be used quite a bit after Schmitt and Cernan return to the Command Module with their dirty bags of rocks and dirty spacesuits and there will be quite a clean-up chore for all three crewmen in the Command Module. America at this time is in it's 49th revolution of the Moon, and about 20 minutes away from disappearing behind the Moon on this revolution. We're showing 3 hours 27 minutes now, until Lunar liftoff.

CAPCOM Okay, we see that.

CAPCOM Doesn't look like the Challenger shifted around much in the last three days.

CHALLENGER Well, at least it always settles back to the same spot.

CAPCOM Okay, you're clear to torque those.

CHALLENGER Say, Gordy, are we clear to jettison the buddy PLSS bag now.

CAPCOM That's affirmative Jack, we've determined that you won't need it for rock stowage. And along the same

CAPCOM line, John Young suggested that you might check your checklist pockets on your suits when you get to that point. His were full of dirt. You might want to take those out and discard them if that's the case, so that it won't fly up and get you at insertion.

CHALLENGER Yeah, we all ready did that, Gordy. They were a mess, and we took them off. They're in the jettison bag now.

CAPCOM Okay.

CHALLENGER We're going to take time out for about 15 or 20 minutes of mandatory house keeping here.

CAPCOM Okay, understand.

CHALLENGER That's prior to suit doning.

CAPCOM Roger.

END OF TAPE

PAO This is Apollo Control at 184 hours 52 minutes. In about 2 minutes 45 seconds, we'll be losing radio contact with Ron Evans aboard America as the CSM goes behind the Moon on the 49th revolution. At the present time, Evans is in the process of checking out the rendezvous transponder on board his spacecraft, the first in a series of steps he'll be taking to configure the CSM for the rendezvous with the lunar module. Aboard the lunar module, Challenger, on the lunar surface, the team of Cernan and Schmitt will soon begin getting into their space suits, getting the lunar module configured for liftoff, a process, a series of steps which they have already begun. And, everything aboard the lunar module appears to be very close to normal. We are looking at one minor problem, and that concerns the water aboard the descent stage of the lunar module. For some reason, the consumption of water has been a bit greater than was predicted. This water is used primarily, at least the bulk of it, is used for cooling equipment aboard the lunar module. It's boiled into the vacuum of the lunar atmosphere and carries away heat from the electronic equipment in the LM. If we run out of water in the descent stage, the crew will simply switch over to the reserves of the ascent stage and use those prior to liftoff. Our current prediction is that the descent water will last up through 186 hours 40 minutes, plus or minus 1 hour, so as early as 185 hours 40 minutes, or as late as 187 hours 40 minutes we could run out of water. In the lunar module module descent stage, if we run out early, again the procedure would be to have the crew switch over to the ascent water supply. This again would, in turn, cause no problem. We have adequate reserves in the ascent stage of the LM for a normal or an abnormal rendezvous and docking. And, in about 30 seconds, we'll be losing radio contact with Evans aboard America.

PAO And, we've had loss of signal now with the CSM. Be reacquiring in about 45 minutes. The spacecraft at that time on the 50th revolution of the Moon. We'll continue with the dual line setup communicating with the CSM on one circuit and the lunar module on another circuit through the next revolution, then beginning with acquisition of signal with the command module on the 51st revolution, which is the LM liftoff rev, we'll be switching to a single communication circuit with a single spacecraft communicator. Again, Cernan and Schmitt appear to be running about 30 minutes behind the flight plan timeline, but we expect they'll have adequate opportunity to make up that time before liftoff in a couple of hours. There are places in the flight plan where there is a bit of a built in pad, and they should have no trouble being ready for an on-time liftoff if things continue to go as smoothly as they are at the present time. Cernan and Schmitt both in good shape for the liftoff. Cernan reported he got about 5 hours of sleep, Schmitt about 6 hours. Both crewmen

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have been eating well, and, along with their vehicle, in good shape for the liftoff and subsequent rendezvous. This is Apollo Control at 184 hours 56 minutes.

SCHMITT Gordie, this is Jack. I just went off biomed briefly.

CAPCOM Okay, Jack.

SCHMITT And, Gene will be on biomed shortly.

CAPCOM Roger.

SCHMITT Gordie, I'm back up.

CAPCOM Okay.

PAO That last report from Jack Schmitt that he and Gene Cernan were reconfiguring their biomedical switches, harnesses, indicates that they're in the process of getting back into their pressure suits at this time.

END OF TAPE

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CHALLENGER Okay, Houston. This is the LMP suited. How
do you read Biomed and voice?

CAPCOM Oh, we're copying your ticker loud and clear.
Also your voice.

CHALLENGER Okay.

CHALLENGER Gordy, I, Gene. I'm going off the air.

CAPCOM Okay, Geno.

END OF TAPE

CHALLENGER Okay, Gordo this is CDR you ought to have
me all back up on the cal and biomed now.

CAPCOM Okay, Geneo looking good.

CHALLENGER CDR, CRD is 17045.

CAPCOM Okay got that.

CHALLENGER LMP is 24150.

CAPCOM Okay.

PAO This is Apollo control at 185 hours
40 minutes. And we're about 45 seconds now from reacquiring
the command module on it's 50th revolution of the Moon. During
this front side pass Ron Evans aboard America among other
things will be performing some land mark tracking using the
optics equipment on the command module. This will provide
information on the precise orbital plane of the command module
that information then to be fed into the lunar module guidance
system and used in the targeting of the lunar module for lift-
off and subsequent rendezvous with the CSM. On the lunar
surface aboard Challenger, Gene Cernan and Jack Schmitt have
completed suit up. Their in the suits unpressurized without
helmets and gloves on at the present time. And appear to be
about 20 minutes behind the timeline. They made up about
10 of the 30 minutes they were down and it looks like they
will have no problem getting caught up about an hour and
15 minutes before liftoff would liftoff essentially on time.
However, as we mentioned earlier the LM liftoff will be about 1 min-
ute 10 seconds earlier than the preflight flight plan called
for. Liftoff based on the preliminary information generated
by the flight dynamics officer to occur at 188 hours 1 minute
44 seconds. And we'll expect to have the flight dynamics
officer final numbers for liftoff probably about an hour or
to an hour and 15 minutes prior to liftoff.

END OF TAPE

CHALLENGER Okay, Gordo, we're ready to donn the helmets and gloves.

CAPCOM Okay.

CHALLENGER Okay, Gordo. We're going to press on, but don't let us miss 185:58 for the VHF check, will you?

CAPCOM Sure won't. We're watching them.

CHALLENGER Okay.

CAPCOM Challenger, Houston. We're getting close to the bottom on descent water. We're expecting to have to switch to SM water sometime in the next hour. We'll give you a call.

CHALLENGER Okay, Gordy.

CHALLENGER They cleaned them up for you. What more could you ask?

CHALLENGER Yes. Hey, Houston. We're VOX now.

CAPCOM Okay, and locked on VOX.

CHALLENGER Is the recorder all set?

CHALLENGER Yes. The recorder's on, but I don't think it's going to work. See if I've got anymore juice in here. I owe Don Arabian something.

CHALLENGER Wristlet covers. Donn wristlet covers.

CHALLENGER Okay, my right, right drogue is on and locked. Verified.

CHALLENGER Oh, I just came to the end of my grief. Probably a good time, because if everything goes the way it's supposed to, I shouldn't put on these EV clothes anymore.

CHALLENGER Don't you use that in your ivy?

CHALLENGER No, I don't need it with my ivy.

CHALLENGER Mine are all on and verified. Locked. (garble) suit flow.

CHALLENGER Okay, we got 8 minutes to the COM check, so let's press on.

CHALLENGER Hate to get in the middle of the integrity check, oh we can do it. This won't take long.

CHALLENGER (garble) with your glove.

CHALLENGER I will. Okay.

CHALLENGER Let me. Buggish today.

CHALLENGER Turn that off.

CHALLENGER Well, I did once, Gene, and I, didn't help, and I started to run out of air.

PAO Cernan and Schmitt are fully suited at this time, running pressure integrity checks on the suits, prior to depressurizing the cabin and jettisoning about 45 pounds of unneeded equipment.

CHALLENGER Okay, stay facing that way. Pressure integrity check. Suit shall not be maintained elevated pressure graded 5 minutes. Okay, (garble), pull the egress. Verify.

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CHALLENGER Okay, that's verified.
CHALLENGER Cabin gas return egress. Verify.
CHALLENGER Egress verified.
CHALLENGER Two circuit relief closed.
CHALLENGER Both closed.
CHALLENGER Okay, we will leave pressure REG A closed.
CHALLENGER Yes sir.
CHALLENGER Pressure REG B direct 2 and we'll go up to
37 (garble) on the cup gauge and then you want to egress on it.
CHALLENGER Okay.

END OF TAPE

CHALLENGER Okay, going up. I'm in direct 02.
CHALLENGER Hey, two circuits coming up.
CHALLENGER These circuits about 72 now.
CHALLENGER Should be coming off the peg shortly.
CHALLENGER I'm off the peg.
CHALLENGER And I'm off the peg.
CHALLENGER You can stop it on your cuff gage.
CHALLENGER Yeah, I will do so.
CHALLENGER That's 3. 35. 37.
CHALLENGER Okay, go egress.
CHALLENGER Okay, mark it. Okay. 375 and CDR was
375.
CHALLENGER Got about 4 minutes for VHF.
CHALLENGER Our suits are going to be good.
CHALLENGER That's the whole circuit.
CHALLENGER Yep, I know.
CHALLENGER Think about the same.
CHALLENGER Got about 10 seconds to GO.
CHALLENGER Okay, mark it. CDR dropped from 375
to 360.
CAPCOM Okay.
CHALLENGER Okay, suit circuit release AUTO. Hold
your ear. AUTO.
CHALLENGER Suit circuit pressure to KA to 4.8
coming down.
CAPCOM Okay, Jack, the next thing to depress
but before we do that, I think we ought to get the VHF
check. It's only 5 minutes away.
CHALLENGER Sure. I got a scratch on my helmet.
Okay, Gordo, where do I configure for the VHF here? Standby
for a call from the CMP.
CAPCOM Okay, sounds like a good idea. And
we'll press on after that. Jack, you better make sure
your volume's up.
CHALLENGER You received B, huh?
CHALLENGER I'm A off and received B on the audio.
CHALLENGER Hey, what do we do once we hear him?
CHALLENGER Okay, when you here him, probably answer
him is the first thing. And then VHF.
CHALLENGER Naw, then you want a TRM.
CHALLENGER You want A transmitter voice-range, and
A to TR, and A transmitter OFF. After conversation. Vic?
CAPCOM As soon as you hear turn the VHF
transmitter to voice-range.
CHALLENGER Yeah, I'll do it.
CHALLENGER Is he going - he's going to try to lock
up on us I guess, huh?

CHALLENGER So. I got us VHF ranging so we'll have to be quiet once we get established.

PAO Coming up in about 2 minutes we'll have a communications check from Challenger on the lunar surface to Ron Evans in America.

CHALLENGER Open these suits.

CAPCOM Challenger, about 30 seconds to the com check.

CHALLENGER Okay, thank you Houston.

CHALLENGER There he is.

CHALLENGER Yeah.

CHALLENGER Okay in VOX.

CHALLENGER Okay, I'm going to go voice-ranging I guess.

CHALLENGER No, wait till he gets the call.

CHALLENGER Hey, Houston, we're reading CMP on VOX.

CAPCOM Roger.

CHALLENGER Hey, Captain America, this is Challenger you're loud and clear.

AMERICA Go to TR

CHALLENGER Okay Ron, you're loud and clear. How do you read us?

AMERICA Okay, you were very good on B, on TR you're in the mud a little bit. On the A.

CHALLENGER Okay, I'm just transmitting duplex bravo.

AMERICA Okay, that's better. You must have turned away from your mikes. How you doing?

CHALLENGER Okay, I'm doing great now standing by for you to do a little landmark tracking as I go over this time.

CHALLENGER Okay. Are you at voice-range, Jack.

CHALLENGER Yes, I am.

CHALLENGER Ron, are you going to do any ranging at all?

AMERICA Negative on ranging.

CHALLENGER Okay, read you loud and clear. How's America looking to you?

AMERICA Hey, outstanding. I tell you. It's a beautiful bird.

CHALLENGER Yeah, we got a beautiful bird down here. We'll see you up there shortly.

AMERICA Okay, you're kinda fading out a little bit.

CHALLENGER Hang in there and keep the prob extended.

AMERICA Okay.

CHALLENGER Okay, we're going to VHF OFF.

AMERICA Okay, we'll see you when - just prior to lift off then.

APOLLO 17 MISSION COMMENTARY 12/14/72 14:45 CST 185:52 GET 740/3

CHALLENGER Okay. Check the VHF A transmitter OFF.
AMERICA A OFF.
CHALLENGER That's all you need to do.
CHALLENGER Outstanding.
CAPCOM Okay, Challenger, you have a go for
us for depress.
CHALLENGER Okay, standby one.
CHALLENGER I doubt it.
CHALLENGER You might be able to. It's awfull
glary though.
CHALLENGER He'll be well sun-lit up there.
CHALLENGER I doubt it.
CHALLENGER Okay, we have a GO for depress, Jack.
CHALLENGER On 16 ECS cabin repress OPEN.
CHALLENGER Cabin repress coming OPEN.
CHALLENGER OPEN.
CHALLENGER Why don't you watch your gage and I'm
going to ---
AMERICA Guess I can turn my VHF OFF, if there's
is OFF.
CHALLENGER Okay. I'm going to open the forward
dump to AUTO to 35.
CHALLENGER Okay, I watch - did go OFF.
CHALLENGER Hey, it coming down?
CHALLENGER Okay, it's 5, 4 and a half, 4, standby
mark. 3.5.
CHALLENGER Okay, verified. Circuit lock up at 43
at decay; okay at 45, standby for the decay. Oh, man, I got to
go get that water circ locked.
CHALLENGER Hold at 2, huh?
CHALLENGER Oh, boy.
CHALLENGER Want me to get it.
CHALLENGER No. I got longer arms.
CHALLENGER I guess. I can reach back in there, okay?
CHALLENGER If you can get back there.
CHALLENGER I think ---

END OF TAPE

CHALLENGER Now, they want it?
CHALLENGER Yeah, now.
CHALLENGER Okay, hold the tube. Okay?
CHALLENGER Happy with the suit circuit, and, yeah, we
got a decay in the suit loop.
CHALLENGER Okay.
CHALLENGER Okay, verify suit circuit locked up. I'm
dumping all the way. Okay?
CAPCOM Cabin pressure dropping down through 2-1/2 pounds
now.
CHALLENGER Circuit 42.
CAPCOM Approaching 1 pound cabin pressure.
CHALLENGER There's .7 in the cabin and 41 in the suit.
CHALLENGER About 4.0, and the cabin is .3.
CHALLENGER Okay, let me see if I can jog --
CHALLENGER Okay, I guess we're go for EVA-4.
CHALLENGER Five, isn't it?
CHALLENGER Five just start?
CHALLENGER Oh, man, I got an open -- if I could bleed
that pressure -- oh, boy. Hey, hold it here for a minute. There's
a lot of psi on that hatch.
CHALLENGER Okay, that'll hack it. Let me go to auto
here. Need my checklist. Make it, Oops, that's closed, ha.
That's auto in the lock lock is on? Okay? Action. Open, all
the way, probably.
CHALLENGER Why is that still waving in the breeze?
(Garble).
CHALLENGER There's a solar wind in here.
CHALLENGER We're on 7 dash something here. Still vent-
ing, are we?
CHALLENGER Houston, how's our cabin configuration? Mean
there's still the -- had a little breeze going out the hatch.
CAPCOM Uh, all the numbers look good here, Jack.
CHALLENGER Hey, hold that, Jack.
CHALLENGER Okay.
CHALLENGER Okay. Ready?
CHALLENGER Okay.
CHALLENGER Partially open, that's good. (Garble) jetti-
son the jet bag. Hey, here goes Santa Claus' --
CHALLENGER Here you go, Santa Claus.
CHALLENGER -- Santa Claus' bag.
CHALLENGER Another bag of goodies. Give it the old --
CHALLENGER There you go.
CHALLENGER -- 3-point kick.
CHALLENGER Right. Beautifully done. Just where we
wanted it. All clear to the ascent stage.
CHALLENGER Need the --
CHALLENGER Okay, clear. Good boy. Now, for your next
act --

CHALLENGER No, don't --
CHALLENGER Don't even think about it.
CHALLENGER Okay.
CHALLENGER Okay? Jettison bag. All items are clear of
ascent stage. Ready to close hatch?
CHALLENGER Looks like it.
CHALLENGER End of EVA 5.
CHALLENGER Are we STAY NO STAY for hatch closure?
CAPCOM You have a GO for closing hatch.
CHALLENGER Okay. Okay, the hatch is closed.
CHALLENGER Boy, is it easy to get around in here without
a PLSS on.
CHALLENGER Okay, your dump valve verified in AUTO?
CHALLENGER Yes sir, and locked.
CHALLENGER Okay. Cabin repress. Okay. Okay, verify
it's AUTO?
CHALLENGER It's AUTO.
CHALLENGER Okay, on 16, cabin repress closed?
CHALLENGER Okay, cabin repress going closed.
CHALLENGER And, the hatch looked clear when I -- seals
were clear when I closed the hatch.
CHALLENGER Okay. Closed.
CHALLENGER There's the master alarm. And the cabin is
coming up.
CHALLENGER OX 02.
CHALLENGER Okay, cabin is increased, and you can go to
cabin on first red beep. It's in cabin. (garble) Every warning
light will go off here shortly. And, my suit's coming down.
CHALLENGER Mine, also.
CHALLENGER Okay, we're just about to go to 50 percent,
descent 02. We're there.
CHALLENGER Okay, cabin's almost at regulating pressure.
Okay, cabin lights go on.
CHALLENGER Next thing we'll do when it stabilizes, we'll
doff our gloves, doff our helmets, locked up.
CHALLENGER Okay, 5.0.
CAPCOM Okay. You can doff your gloves.
CHALLENGER Gene, let me watch that pressure a minute.
CHALLENGER Well, it looks like it's stable at five.
Okay?
CHALLENGER How's the cabin look, Houston? Looks good
here.
CAPCOM Okay, it looks good here.
CHALLENGER Okay.
PAO That EVA lasted the total of 1 minute from
hatch open to hatch closed.

APOLLO 17 MISSION COMMENTARY 12/14/72 CST 14:55 GET 186:02 MC741/3

CHALLENGER Physics says it should have been. There's
an experiment.

CHALLENGER Not really, since we do that with our PLSS
and everything else.

CHALLENGER Okay. Take your helmet off.

CHALLENGER Boy, that was painless enough.

CHALLENGER Jack, I'd wrap that thing around it like that.

CHALLENGER Wait a minute, don't -- take our helmets.

CHALLENGER Not yet. We -- so obviously go behind the
engine cover. Okay?

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/14/72 CST 15:05 GET 186:12 MC-742/1

CAPCOM Challenger, Houston. Just a reminder. Before you stow the right hand OPS on the floor, you need to attach the floor hole cover.

CHALLENGER Okay, Jack's down there cleaning up the floor now and I'm working on the visors.

CAPCOM Okay.

CAPCOM Challenger, Houston. We have a copy of an update on the rock stowage that was given to you last night. We're not sure if they read one part of it to you. And that was concerning using some contingency webbing to reinforce the tie down of the bag that goes on the Z-27 bulk head. If you did get that update, forget it. We do not need any extra tie down other than the normal tie down. Over.

CHALLENGER Okay, Gordy. That's for the BUDDY PLSS bag, I guess and we did not get it, but we haven't quite stowed that yet anyway so we will forget it.

CAPCOM Okay.

CHALLENGER Are Rover batteries still alive?

CAPCOM I'll check with (garble). Stand by.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/14/72 CST 15:15 GET 186:22 743/1

CAPCOM Challenger, Houston, I'm standing by
with a pad anytime you're ready.

CHALLENGER Okay, Gordie, I'll be ready in just a
minute.

PAO This is Apollo control at 186 hours
42 minutes. Cernan and Schmitt aboard the lunar module
Challenger at this time are getting the cabin of the vehicle
ship shape for liftoff. They're essentially back on the time-
line at this time and ready to begin the final liftoff pre-
parations. Aboard the command module America now in its
50th revolution everything continues to go very smoothly.
Ron Evans is beginning to get suited up and configuring the
command module for the LMs liftoff, rendezvous and docking.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/14/72 CST 15:36 GET 186:43 744/1

CHALLENGER Okay, Gordie go with the ascent pad.
CAPCOM Okay, Jack. This is the direct ascent pad. TIG is 188 01 3593, NOUN 76 is 55408 00320 minus 0005, DEDA 047 is plus 37430 minus 72507 plus 58669 plus 56907 plus 00320 plus 05359 and TPI time is 188 55 5700. LM weight 10900 and HA is 629 HP 622. One remark your TIG for one rev late is 190 00 18. Go ahead.

CHALLENGER Okay, Gordie here is your readback. Direct rendezvous - direct rendezvous is 188 01 3593 55408 00320 minus 0005 plus 37430 minus 72507 58669 56907 00320 05359 188 55 5700 10900 629 622. Remark one rev late TIG is 190 00 18. Over.

CAPCOM Okay, that was a good read. Now I have a coelliptic ascent pad. TIG is 188 04 1400 55390 00380 minus 0005 plus 37430 minus 72507 58630 56907 00380 rest of the pad down to LM weight is NA. Your LM weight is 10900, and the HA and HB are NA. Over.

CHALLENGER Okay, coelliptic read back: 188 04 1400 55390 00380 minus 0005 plus 37430 minus 72507 58630 56907 00380 rest of pad is NA except for LM weight 10900. Over.

CAPCOM Okay, that's a good read back. Turn to page 10 I have the CSI pad coelliptic.

CHALLENGER Hey, Gordie I'm starting to pick up the breakers on panel 11.

CAPCOM Okay, Geneo.

CHALLENGER Okay, Gordie CSI on page 10.

CAPCOM Okay TIG is 189 01 5381. Take a TPI is 190 55 0000. NOUN 81 is 0539, and Delta VY is a plus all balls. 37305419 06550 plus 0539 plus all balls and plus 0012.

CHALLENGER Okay, CSI pad 189 01 5381 190 55 all zeros plus 0539 plus all zeros 05419 06550 plus 0539 plus all zeros plus 0012. Over.

CAPCOM Okay, that's a good read back. That's all I have for you.

END OF TAPE

CHALLENGER Okay.
PAO This is Apollo Control at 186 hours 54 minutes. We've just had loss of signal now, with Ron Evans aboard the Command Service Module. Everything going very smoothly at this time, and our preparations for Lunar lift-off will be reacquiring the Command Module in about 45 minutes. And at that time, we plan to reconfigure the CAPCOM or air-to-ground circuits with the two vehicles, so that we have both the Command and Service Module and the Lunar Module on the same circuit for the single spacecraft communicator operation. Included in the string of numbers read up to the crew aboard Challenger by CAPCOM Gordon Fullerton, was the time that will be used for ignition -
CHALLENGER (garble) 4.
CAPCOM Roger, Geno.
PAO The ignition time for Lunar lift-off now, as passed up to the crew, is 188 hours, 1 minute, 36 seconds. And that burn time on the Lunar Module ASCENT engine will be 7 minutes, 20 seconds.
CHALLENGER Okay, Gordo. The rendezvous radar looks a little warm and I'm reading about 90 degrees.
CAPCOM Okay, 90.
CHALLENGER Okay, Gordo, are you ready for AG status to operate?
CAPCOM Let me check. We're ready Jack, go ahead.
CHALLENGER Okay, Gordo. Now it's 72. RQ is not varying. I've got both shaft and trunion cross-pointers varying.
CAPCOM Okay, Geno. We copy that.
CHALLENGER Okay, Gordy. On the radar test every thing is GO, everything is within limits. The only anomaly is the one I just reported.
CAPCOM Okay, Geno. And 20 seconds here on the hour even we'll have a site hand over to Goldstone.
CHALLENGER Okay.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/14/72 GET 187:01 GET 15:54 MC746/1

CAPCOM Challenger, Houston. You can go ahead and park the radar at 0 and 30.

CHALLENGER Yes. It's gone there right now, as a matter of fact.

CAPCOM Okay.

CHALLENGER Okay, Houston. The AGS gyro calibration is complete and looks pretty good. I guess these are little, little, no, yes, these are little more than you'd expect I guess.

CAPCOM Okay, Jack.

CAPCOM Challenger, Houston. Words on the radar. When you parked it there, we saw it go to the proper places. From all our indications, the interface between the radar and the PGNS is okay. And our best guess is some kind of selftest problem.

CHALLENGER Okay, Gordy. Thank you.

CHALLENGER Rate gyros are good.

CAPCOM Roger.

CHALLENGER Okay, Gordo. I'm going to go to auto on the S-band, if you want it.

CAPCOM Okay, we're GO and go ahead with the check.

CHALLENGER Okay, Gordy. I'll give you a call, before I fire, but we're in the process of getting ready for the RCS.

CAPCOM Roger.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/14/72 CST 16:04 GET 187:11 MC747

CHALLENGER Okay, Gordo, here we go.
PAO Cernan and Schmitt, at this time, are firing the reaction control system thrusters in what's called the hot fire test. Everything continuing to progress smoothly toward liftoff at 188 hours 1 minute 36 seconds. And, we expect to have the lunar surface television up and in operation in about 10 minutes.

CHALLENGER Gordie, the AGS check looked good.
CAPCOM Roger. Looked good here also.
CHALLENGER Okay, just to make one more talkback still sticky.
CAPCOM Roger, Jack.
CHALLENGER Okay, here we go into PNGS, Gordie.
CAPCOM Okay, Geno.
CHALLENGER Looked good here, Gordie.
CHALLENGER And, you've got DATA and POO.
CAPCOM Okay, your uplinks are coming. We'll give you vector and zero the power cells unless it's okay.
CAPCOM Challenger, Houston. We'd like you to put the ascent batteries on according to the procedures on the next page, 8-8. Just a little early because of preconditioning notice before descent, and we checked your RGA's during the hot fire, and the hot fire itself, and they both look good.
CHALLENGER Thank you, Gordo.
CAPCOM And, Challenger, it's your computer now.
CHALLENGER Thank you.
PAO This is Apollo Control. We're now 45 minutes from LM liftoff. Everything continuing to go very smoothly. We've completed the reaction control system's checkout. It looks good through the telemetry we're receiving here on the ground. Also, aboard the spacecraft, the primary guidance and backup guidance system clocks have been synchronized. The next item on the crew's preparation checklist will be to align the platform of their guidance system which is used as a stable attitude reference. And, we're now some 20 minutes from reacquiring the command module, which is now in its 51st revolution of the Moon. And, as mentioned before, when we do acquire, we'll have both the LM and the command module on the same communication circuit.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/14/72 GET 187:20 CST 16:13 MC748/1

CHALLENGER Gordo, did you ever get any word on the Rover battery?

CAPCOM No. I sure haven't. Haven't heard on that one.

CHALLENGER It's not important. I just wondered whether things were going to be working back there.

CAPCOM Okay, we got no reason to believe they won't. When you get down to parking the rendezvous radar antenna after this P57, give me a call. We're going to change the parking position.

CHALLENGER Okay.

CHALLENGER Why don't you just give me the numbers now?

CAPCOM Okay. Do a, as the checklist shows, except do a VERB 41 NOUN 72 to 0 and 30 degrees. Go to slew and then delete the manual slew for 3 seconds. They want to leave it there for temperature purposes. This will be a cooler position for it during ascent.

CHALLENGER Okay. Understand. That's 0 and 03 000.

CAPCOM That's affirmative.

CHALLENGER And the first 01, first 04 was .01.

CAPCOM Roger, we got that.

PAO Cernan and Schmitt at this time are in the midst of the platform alignment and we're standing by for television from the lunar surface. The other camera on the Lunar Rover. And we're getting the first, first bits of the picture now. We should have color. And we do have a color picture from the lunar surface.

CAPCOM Challenger, Houston. We've got you on television now. Have a good picture.

CHALLENGER Glad to see old Rover's still working.

CAPCOM Okay, we got your NOUN 5.

END OF TAPE

CAPCOM Go ahead untorque them.

PAO This is Apollo Control at 187 hours 31 minutes, now approaching 30 minutes until time for Lunar lift-off. The count down toward lift-off is going very smoothly. The crew aboard Challenger has completed aligning their inertial platform that's used as a stable attitude reference during powered flight. And we're less than 6 minutes now from regaining our radio communications with Ron Evans, aboard the Command Service Module, America. The television picture is coming to us from the Lunar Roving vehicle, parked about 490 feet west of the Lunar Module, looking toward the east. Cernan and Schmitt will shortly be going through their prelaunch switch checks, checking the configuration of all the switches in the Lunar Module. They'll then don their helmets and gloves.

CHALLENGER Okay, Houston. (garble) looks good and the TIG's in auto.

CAPCOM Okay, Challenger, there's no change to 047 and 053. I do have a K factor for you.

CHALLENGER Go ahead.

CAPCOM Okay. It's 179, 59, 5982. Over.

CHALLENGER Okay, 179, 59, 5982.

CAPCOM That's right, Jack.

CAPCOM Challenger, Houston. I have a couple of PIPA BIAS updates, for the PNGS.

CHALLENGER Okay, go ahead.

CAPCOM Okay, a verb - with a VERB 21 NOUN 1, load address 1452 with 03045, and load address 1454 with 05246. Over.

CHALLENGER Okay, that's 1452 with 03045, and 1454 with 05246.

CAPCOM Read back's good.

PAO This is Apollo Control now 25 minutes from Lunar lift-off. Aboard Challenger, the crew has set up their guidance computer at program 12, which is the program used for the Lunar lift-off. And we're less than 1 minute now, from regaining radio contact with Ron Evans aboard America.

CHALLENGER Okay, they're in, Houston.

CAPCOM Okay. Look good to us.

PAO And, we've had acquisition of signal now, from the CSM. About 10 minutes from now, the Lunar Module's scheduled to begin pressurizing the ASCENT propulsion tanks.

AMERICA Hey, Houston. America.

CAPCOM Roger, America. This is Houston, you're loud and clear.

APOLLO 17 MISSION COMMENTARY 12/14/72 CST 16:23 GET 187:29 MC-749/2

AMERICA Okay, Gordo. Got my suit on -
CAPCOM Okay, Ron. We gave you the wrong SKINNY
on the COMM configuration last REV. We're actually now, in
a full MSFN relay mode. We'd like you to stay off of
VOX. Over.

END OF TAPE

CHALLENGER Can do I'm off VOX.
CAPCOM Challenger, Houston, when you get to a break point I have some words on what you can expect in the way of guidance steering. Over.
CHALLENGER Stand by.
CHALLENGER Okay, Gordie you can go ahead and talk while we're putting our helmets and gloves on.
CAPCOM Okay, we never got around to debriefing you on PDI, but the out of plane indications you saw on the AGS during descent were proper. We had changed your vector slightly just prior to PDI. And so the AGS were navigating and indicating properly. We just ran the present ascent targets in the LMS with the half a mile cross range is shown on the pad. And, you're going to be steering south. That's the way the steering direction goes that's to your left for Geno's benefit. And, the crosspointer indicated a maximum of about 13 feet per second of plain velocity at about ignition plus 3 minutes and 50 seconds and then came on back to zero. Over. That velocity was AGS (garble).
CHALLENGER Okay, Gordie that's good information to have. Understand the AGS on that one, okay.
PAO This is Apollo control coming up now on 18 minutes until lunar liftoff.
AMERICA (Garble) attitude.
CAPCOM Roger, America.
PAO And flight director Gene Kranz has just gone around the room checked with all flight controllers. We're go for lunar liftoff.
CAPCOM Okay.
CHALLENGER Ascent water is open, Houston.
CAPCOM Roger.
PAO And we've now switched over to the water on the ascent stage to be used in cooling electronic equipment, as called for in the flight plan. There was some concern that we would run out of descent water before we switched over to ascent water, but the water in the descent stage lasted as long as it was required.
CHALLENGER Okay, Houston, we're at liftoff minus 17 minutes and verb 47 is going over.
CAPCOM Roger, Challenger.
CAPCOM America, we see your cabin at 5.5.
AMERICA Okay, thank you. Direct 02 is closed.
CHALLENGER Houston the descent batts are coming off.
CAPCOM Roger.
CAPCOM America it looks like to us there.
Your maneuver has stopped maybe you hit the stick.
AMERICA Roll around in this thing you knock the thing off of lock.

APOLLO 17 MISSION COMMENTARY 12/14/72 CST 16:33 GET 187:39 750/2

PAO This is Apollo control now 15 minutes
from lunar liftoff. The descent stage tanks have been de-
pressurized. We're about 1 minute now from beginning pres-
surization of the ascent stage tanks.

CAPCOM Challenger, we're recommending PGNS direct
rendezvous.

CHALLENGER Roger, Gordo understand PGNS direct
rendezvous for Challenger.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/14/72 CST 16:40 GET 187:48 MC751/1

CAPCOM America, OMNI Delta (garble)
CAPCOM America, Houston. Voice check.
AMERICA Okay, hold --
CHALLENGER Hello, Houston. Challenger. Circuit breakers
are configured, we're on the top of 8-16.
CAPCOM Challenger, Houston. Okay, sounds good.
CHALLENGER And, we're standing by for liftoff minus 10.
CAPCOM Roger.
CHALLENGER And, Houston, are you in relay now?
CAPCOM We had -- we lost high gain on America, so
we inhibited the down link. We're not in relay, no.
CHALLENGER Okay.
CAPCOM We're actually on a one-way relay. Ron should
be able to hear you, but not vice versa.
PAO This is Apollo Control. Gene Kranz now getting
a GO for ascent stage pressurization.
CHALLENGER Okay, Houston. Coming up on 10 minutes, and
we're ready to pressurize the APS.
CAPCOM Okay, you're GO to pressurize the APS.
CHALLENGER Okay, the master arm is coming on. I've got
two good lights. (Garble) is selected.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/14/72 GET 187:52 CST 16:45 MC752/1

CHALLENGER (garble) selector. Okay, FM helium press tank 1 fire. Ready, 3, 2, 1, mark it. We got a squib fire, Houston.

CAPCOM Roger.

PAO And we can confirm the ascent stage tanks are pressurizing.

CAPCOM Challenger, You're GO for tank 2.

CHALLENGER Okay, understand. GO for tank 2. Ready? Okay. 3, 2, 1. Mark it. Tank 2. We got the squib.

CAPCOM Okay, Challenger both tanks look good.

CHALLENGER (garble) balance off

CHALLENGER Okay, master arm is coming off and the lights are out. Okay, Jack system A ascent feed 2 open. Okay, monitor your, okay, system A main stop closed.

CHALLENGER How does it look to you?

CHALLENGER Okay, B ascent feed 2 open.

CHALLENGER I could feel them in the floor when they go.

CHALLENGER Okay, and B main stop closed. Check your manifold pressures. Are you happy. Okay, Houston, we got ascent feed.

CAPCOM Roger and America, can you read Houston. Over.

AMERICA America. Roger. Loud and clear.

CAPCOM Okay, Ron, you're loud and clear.

CHALLENGER Okay, we're standing by for 5. Houston, Challenger is GO for liftoff. We're at 7:54 and counting.

CAPCOM Roger, Challenger. You're GO for liftoff.

CHALLENGER Roger. Understand. Challenger is GO for liftoff.

CAPCOM Challenger, Houston. We think the transducer in tank 2 has shifted. We want you to monitor tank 1 for APS helium. Over.

CHALLENGER Roger. We were looking at that and we'll monitor 1. What is it you want?

CHALLENGER I need the, the big one there with the parts on it.

CHALLENGER Here you go.

CHALLENGER Thank you.

CHALLENGER That's alright.

CHALLENGER Okay.

END OF TAPE

CHALLENGER Let's go over the after burn card
CHALLENGER Okay.
CHALLENGER I display engine override and logic,
breaker is in, circuit breaker stat control all closed on
panel 11 except AEA and CDA power.
CHALLENGER Okay, stat control breakers are all closed
except AEA and DCA power.
CHALLENGER Logic breaker's IN
CHALLENGER Logic breaker's IN and all of mine are
closed except descent engine override. Logic's IN.
CHALLENGER Okay.
CHALLENGER Rate scale. 25 degrees per second.
CHALLENGER 25. Attitude translation 4 jets.
CHALLENGER 4 jets.
CHALLENGER Sound couple ON.
CHALLENGER ON
CHALLENGER Dead band min.
CHALLENGER Dead band min.
CHALLENGER Port abort stage reset.
CHALLENGER Port abort stage reset.
CHALLENGER Attitude control 3 to mode control.
CHALLENGER Attitude control 3 on mode control.
CHALLENGER Okay, and you're going to be in AUTO
and at HOLD.
CHALLENGER PNGS is AUTO and AGS is at HOLD.
CHALLENGER Stop push-buttons are reset and -
CHALLENGER Reset here.
CHALLENGER And you're in jet.
CHALLENGER I'm in jet.
CHALLENGER Okay.
CHALLENGER Say, let's take a swing around the
system.
CHALLENGER I just did. Everything looks good.
The Propellant pressure is holding up. The tie to the
ascent tanks and the RCS.
CHALLENGER Okay. 5 minutes and my
CHALLENGER At 18 rendezvous radar breaker is CLOSED.
CHALLENGER And let's go. The time line book.
CHALLENGER Got it.
CHALLENGER Make sure of everything in here.
CHALLENGER Okay. At 2 minutes I'll get the master
armed.
CHALLENGER We already are VOX.
CHALLENGER You get 400 plus 1.
CHALLENGER Okay, and I'll get the camera and - okay,
10 seconds I'll hit the abort stage followed by the engine
on the ascent. You get the PRO. I'll back up the start.
If we don't get a start, I'll go guidance control to AGS.
I'll wipe out the thrusters. I'll go AGS AUTO. And if
we don't get a start, we'll back OFF. Okay.

APOLLO 17 MISSION COMMENTARY 12/14/72 16:49 CST 187:56 GET 753/2

CHALLENGER Okay.
CHALLENGER Houston, we have an awfull lot of noise
coming up.
CAPCOM Okay. Challenger, I understand.
CHALLENGER I think we can read you , Gordy. You
sound pretty good now.
CAPCOM Roger.
PAO Three minutes now till lift off. Every-
thing looks good.
CHALLENGER VHF noise, Jack.
CHALLENGER VHFC.
CHALLENGER Okay, I can cut it out with a high squelch.
On Bravo.
CHALLENGER Okay, Houston, Challenger's at 2 minutes
and 50 seconds.
CAPCOM Roger, Jack, everything looks great down
here.
CHALLENGER We're go for PNGS. Correct. Okay?
CHALLENGER I'm not going to be able to squelch him
out any more.
CHALLENGER Okay.
CHALLENGER Turn your volume down a little more.
CHALLENGER Reading you loud and clear America. This
is Challenger. We're coming up on 2-10 from lift off.
CHALLENGER We'll be with you shortly.
CHALLENGER Okay, Jack, double check your logic power
breaker.
CHALLENGER Check.
CHALLENGER Okay. Master arm is ON. I've got two good
lights.
CHALLENGER (garble) I've got 400 plus 1M.
CHALLENGER Okay.
CHALLENGER My watch is reset.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/14/72 CST 16:53 GET 187:59 MC754/1

CHALLENGER Okay, you got 367, you want to pick up the camera just before I hit ABORT stage.

CAPCOM Coming up on 1 minute, and we look good.

CAPCOM 1 minute coming up, Gene.

CAPCOM 1 minute coming up, Gene.

CHALLENGER Take your final look at the valley at Taurus-Littrow. Except from orbit. Hey, 1 minute, Houston, we're 50 seconds now, and we're GO.

CAPCOM Roger, you're looking good here.

CHALLENGER I'll get that in 30, okay?

CHALLENGER Camera -- camera's not going to run without me holding it.

PAO 15 seconds.

CHALLENGER C average D, 20 seconds. Aw, shoot.

CHALLENGER Okay, now, let's get on and forget the camera.

CHALLENGER Okay, 10 seconds. ABORT stage --

CHALLENGER ABORT stage -- push -- it's in armed.

CHALLENGER Okay, I'm going to get the pro. 99 proceeded 3, 2, 1, ignition. We're on our way, Houston. Vents are good.

AGS on. Pitchover.

CAPCOM Roger, you have good thrust.

CHALLENGER Okay, 30 seconds. 308 is your number.

CHALLENGER Take after 1500 feet.

CHALLENGER And, 8 dot looks good.

CAPCOM Roger, we've lost data right now, but we'd like APS OMNI, APS OMNI, please.

CHALLENGER Okay, coming up on 40 seconds, and we're going, coming right over the top of Camelot.

PAO And, we show an altitude of 2700 feet.

CHALLENGER Awful lot of static, Jack. We break locks?

CHALLENGER Yep.

CHALLENGER Why don't you get it on an OMNI or something?

CHALLENGER Yeah, it got it. It's on the OMNI.

CAPCOM Roger, Challenger, you're loud and clear, and both systems look good. You're right on the line.

CHALLENGER Okay. Could be about 145 and minus 47.

PAO Altitude 5500 feet.

CHALLENGER Get comm.

CHALLENGER I will.

PAO Both guidance systems agree, we're nearing 8000 feet altitude. Ascent engine performing very well.

CHALLENGER 130, Houston. We're in the blind, and we're GO.

CAPCOM Roger, we'd like the AGS to AUTO.

CHALLENGER Okay. I got good block -- no. Trying to hold. Okay, Houston, coming up on 2 minutes --

CAPCOM Challenger, you're GO at 2 minutes, we'd like AGS to mode control AUTO. Over.

CHALLENGER Okay, you watch the table, Geno.
CHALLENGER I'm watching it. Just get COMM if you can.
CAPCOM Challenger, Houston. How do you copy Houston?
CHALLENGER Okay, Houston, Challenger's GO coming up on
230. We're through 19 K.
CAPCOM Roger, Challenger. We need a 623 plus 10 000
in the AGS. Over.
CHALLENGER Well, those are the angles. How about an --
an OMNI (garble)?
CHALLENGER I've got -- I tried it. I've got --
CAPCOM Challenger, Houston. APS OMNI, please.
Would you relay, America?
CHALLENGER Okay, Houston. 3 minutes, and Challenger is
GO. We're through 25 K.
CHALLENGER I tried it -- I tried it, Ron, and it doesn't
hold. It doesn't help.
CHALLENGER Try APS OMNI again, Jack.
CAPCOM America, Houston. Tell Challenger that
they're right on the money on trajectory, and both systems are GO.
Over.
CHALLENGER All my COMM breakers are in. Try APS OMNI
again.
CHALLENGER Okay, Houston. In the blind, Challenger's
GO, coming up on 325, and they're at 30 K.
CAPCOM Okay --
CHALLENGER There's APS. How do you read, Houston?
CAPCOM America, would you relay to Challenger to
go APS OMNI?
CHALLENGER We are APS OMNI. I do read.
AMERICA They are in APS OMNI right now.
CAPCOM Okay, America, tell Challenger --
CHALLENGER And, we're reading Houston.
CAPCOM -- we're reading them 5 by.
CHALLENGER Okay, we're reading you, Houston.
CAPCOM Okay, Jack --
AMERICA Okay, Challenger, America, okay, you got them.
CAPCOM -- We need a 623 plus 10 000. Jack, give us
a 623 plus 10 000.
CHALLENGER Okay, 4 minutes, Challenger's GO, we're
through 37 K.
CAPCOM Roger, Challenger. You're looking good here.
CHALLENGER Okay, ascent.
PAO We're about 3 minutes from shutdown now.
CHALLENGER Got about a 716 burn, Jack.
PAO Altitude approaching 40 000.
CAPCOM Okay, about 282's coming though great, 41 K,
okay, 430 282's is great, 41 K is great. is good, AGS and
PGNS are right together.

CHALLENGER Okay, Houston. Challenger is GO. We're now
through 435.

CAPCOM Challenger, Houston. We'd like to terminate
ascent feed now.

CHALLENGER Okay. Main valve's going on.

CAPCOM And, the reason is the mixture ratio problem --

CHALLENGER Ascent feed closed.

CAPCOM -- that's just to be conservative and safe.

Over.

CHALLENGER Understand that we're going 5 and we're now
on at 48 K.

CHALLENGER Okay, the camera's stopped.

CHALLENGER Okay burn time's going to be about 18 or 19,
718 or 719, Jack.

CHALLENGER Okay.

PAO About a minute and a half to go. We look
good. Altitude 50 000 feet.

CHALLENGER PGNS and AGS are looking good. A little bit
north.

CHALLENGER Hey, Houston. 540. Challenger's coming
through 52 K. And PGNS says 126 on the 8 dot. We're GO.

CHALLENGER AGS like the plane.

CAPCOM Roger, Challenger. Your trajectory is right
on the money. Both systems are GO.

CHALLENGER Get a good shutoff time now.

CHALLENGER Okay.

CHALLENGER Okay, it'll be 20.

CHALLENGER 720 on the shutoff.

CHALLENGER Okay, we're already terminated ascent feed.
You got 1300 to go.

CHALLENGER Okay. Let's double check everything now.

CHALLENGER You got that, you want --

CHALLENGER Garble

CHALLENGER -- engine arm off with 200 to go. AGS and
PGNS are right together.

PAO Lunar module now nearing orbital velocity,
about 4500 feet per second.

CHALLENGER -- on 57 K.

CAPCOM Roger, and we agree with the --

CHALLENGER 900 to go.

CHALLENGER Copied out nicely.

CHALLENGER Okay, 8 stop is running right out to the
target. 700 to go, coming up.

CAPCOM Okay, normal shutdown and normal TRIM
procedures.

CHALLENGER Roger, normal shutdown, normal TRIM.

CAPCOM Give me a hack at 200, Jack.

CHALLENGER Okay, it's 500 now, mark it, and the ascent
feeds are already terminated.

CAPCOM Okay, very good.

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PAO LM velocity now nearly a mile a second.
CHALLENGER Passing 59 K. 300. Stand by.
PAO Coming up on shutdown.
CHALLENGER 100 to go. Mark it. Okay, engine arm is
off. Okay, stand by for shutdown. 80, 50, shutdown.
CHALLENGER Okay AUTO shutdown.
CHALLENGER AUTO shutdown.
CHALLENGER AUTO shutdown, Houston, AUTO shutdown.
CAPCOM Roger.
PAO Flight Dynamics officer says we can expect
a Tweak burn to trim up the orbit.
CAPCOM Roger, we're reading the DSKY.
CHALLENGER We're showing a 50 by 9.1.
CAPCOM Roger. And, MSFN confirms that orbit --
CHALLENGER Okay. AGS got a little bit out of plane.
First in was 0900.
CHALLENGER Okay, engine stop is reset. Get me attitude
for the Tweak.
CHALLENGER Okay.
CHALLENGER Okay, AGS says it's 9.1.
CAPCOM Challenger, Houston, there will be a Tweak.
Stand by for it.

END OF TAPE

CHALLENGER Okay, AGS says it's 9.1.
CAPCOM Challenger, Houston. There will be a
TWEAK, stand by for it.
CHALLENGER 48 by 9.1, 49 by 9.1.
CHALLENGER Okay, that's our attitude. We're in
attitude for the TWEAK.
PAO TWEAK burn, a little less than 3 minutes
from now, to put the LM in the proper orbit for the rendez-
vous sequence.
CAPCOM Is at 12 plus 12, VX is a minus 4.0,
Y minus 9.0, and Z plus 1.0. That's a 12, 12 minus 4,
minus 9 and plus 1.
CHALLENGER Roger. A 12, 12, minus 4, minus 9 and
plus 1.
CAPCOM That's a good readback.
PAO This will be a very small maneuver per-
formed with the reaction control system thrusters on the
Lunar Module.
CHALLENGER Okay, at 12, 12, Jack, we'll do the
X, Z, Y. I'll do minus 4, then I'll do plus 1 and then
I'll get the Y. That's going to be aft, forward, and left.
A 12, 12, another minute.
CHALLENGER Okay. We're in the attitude, let me
get - say again, you're going to do X and then -
CHALLENGER X, Z, Y
CHALLENGER X, Z, Y. All right.
CHALLENGER AGS is ready.
CHALLENGER Okay, we've got P-47. Stand by for 12,
12.
CHALLENGER And it's - 20 seconds away.
CHALLENGER Okay.
CHALLENGER Okay, I'm going to do X first.
CHALLENGER Okay, let's do it.
CHALLENGER Okay, 1 forward. Little more.
CHALLENGER Okay?
CHALLENGER Okay, and 1 forward.
PAO TWEAK burn is in progress.
CHALLENGER Okay. That's 1 forward and I'm going
9 left.
CHALLENGER Okay.
CHALLENGER Keep her coming, keep her coming, keep
her coming, 9 left.
CHALLENGER That's it.
CHALLENGER Okay, Houston, I re -
CHALLENGER Now, that's it. I'll get this end.
CHALLENGER Good, good. Okay, Houston. 4.1, 9.0
and 1.1. -

CAPCOM Okay, that's good.
CHALLENGER - minus, minus, plus.
CHALLENGER Okay. 47.7 by 9.5.
CAPCOM Roger.
CHALLENGER There's those mysterious noises.
CHALLENGER Yes, that's right.
AMERICA Okay, Challenger, America. I'm going to
try to get the VHF ranging reset.
CHALLENGER Go ahead. We'll keep quiet.
AMERICA Okay reset, now.
PAO And, we confirmed an orbit on the ground
very closely - it agrees very closely with the orbit calcu-
lated on board of 48 by 9 nautical miles.
AMERICA That wouldn't quite do it, let me try
it again.
CAPCOM Challenger, Houston. We'd like (garble).
CHALLENGER (garble) there, you've got it, Houston.
CAPCOM Okay, you're loud and -
CHALLENGER That sounds good on the AGS, Ron. Gene's
getting lock on that.
AMERICA Okay, great.
CHALLENGER Okay, that was me Jack? I just reset the
master - -
CHALLENGER Okay. No functions left on it anyway.
CHALLENGER How you coming, Gene?
CHALLENGER Coming, good.
CHALLENGER P-20 going, huh.
CHALLENGER 26.6 breaking.
CHALLENGER That's not suppose to take those updates.
CHALLENGER Til I tell it to. (garble).
CHALLENGER AGS light for (garble)
CHALLENGER Shaft and tunion look good.
CAPCOM Challenger, Houston -
CHALLENGER We've got 127 miles in 430 feet per second.
CAPCOM That 616 - should be plus 4 balls 5. Over.
CHALLENGER Okay, Gordy. Good call.
CAPCOM Thank you.
CHALLENGER Okay, America, Challenger, we've got
you at 126 miles locked up hard.
AMERICA Okay, got you 125.2 miles now.
CHALLENGER You want that relay still on, Gene?
We're getting a repeat on Ron.
AMERICA I tell you what, let's turn the VHF off.
CHALLENGER Up to you Ron.
AMERICA Okay, I'm just going to turn the VHF off.
CAPCOM Challenger, Houston. There will be no
vector update, no PIPA update. The NOUN 49s you're seeing are

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CAPCOM what we expect. You can go ahead and
accept them.

CHALLENGER Okay, Geno. You can ah -

CHALLENGER Okay, range, range, rate, shaft and tunion
are all gone - -

CHALLENGER Okay, you like everything, you can
start taking your marks, Jack.

CHALLENGER Okay. DAP is changed 22, AGS like
the range.

CAPCOM Challenger, Houston. Also your GO
for APS - TPI.

CHALLENGER Roger. Go for APS - TPI. We're
looking good onboard.

CAPCOM America, Houston.-

AMERICA Okay.

CAPCOM - the NOUN 49, you have there looks
good to us.

CHALLENGER Okay, I checked the inverter, you can
pull inverter 1 breaker.

CHALLENGER Inverter 1 breaker pulled.

AMERICA Okay, you want me to ah - you're not
going to shift me to vector?

CAPCOM Negative, no uplink for you either, Ron.

AMERICA Okay.

END OF TAPE

CHALLENGER Houston, you happy with the OMNIs from the Challenger?

CAPCOM That's affirmative keep it like it is.

CHALLENGER Okay. Terminator's coming up, Geneo. We got light and everything we need.

PAO This is Apollo control. We show the lunar module, Challenger, in an orbit of 47.9 by 9.3 nautical miles now. The CSM in a nearly circular 62 nautical mile orbit. The flight dynamics officer at this time is working up the information that will be used by the lunar module crew in their terminal phase initiation maneuver that puts the lunar module on an intersecting orbit with the command module to be performed with the ascent propulsion system engine.

CHALLENGER Probably because of (garble) or something.

CHALLENGER Okay, anytime you want them. Okay, ready 188.

CHALLENGER Hello Houston. Challenger has a visual on America at about 112 miles.

CAPCOM Okay and Americas just called. I don't know if you heard him. He hasn't got you in the sextant yet. You might check light on. He is getting a VHF marks. Over.

CHALLENGER Okay light is on. Okay 55 and 5700. That's good.

PAO That was Jack Schmitt confirming visual acquisition of the command module about 112 miles away.

CHALLENGER The AGS saw that out of plane Geneo.

CAPCOM Challenger, this is Houston. I have a MSFN TPI for you.

CHALLENGER Go ahead.

CAPCOM Okay Delta-VX is a plus 74.0 Y plus 3.9 and Z plus 9.0. Delta-V total is 74.7 and for once they didn't give us the breaking, Jack.

CHALLENGER Okay, plus 74.0 plus 3.9 plus 9.0 and total 74.0.

CAPCOM That total is 74.7.

CHALLENGER Sorry. Okay 74.7.

CHALLENGER I'm working on my third mark.

CHALLENGER And Houston, Challenger. I still have a visual on America.

CAPCOM Okay, I'm sure Ron's problem is he is looking into the Sun.

CHALLENGER That's right because he's sunlit up there.

AMERICA Yes, you are correct Houston.

CAPCOM Challenger we'd like ASC OMNI now.

CHALLENGER Okay, going ASC.

CHALLENGER America, how do you read Challenger?

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CHALLENGER He's not he turned his VHF off. You
want it on?
AMERICA I'm reading you relay now Challenger.
This is America.
America Okay, that's fine, Ron.
AMERICA Let me know when you want a voice - VHF
voice check there and we'll make sure we go to VHF.
CHALLENGER Okay, and we're holding you at 93 miles
right now.
AMERICA Roger, at about 92.7 which is probably
delay.
CHALLENGER Okay, and you just went into darkness
up there. I lost you.
AMERICA Should be able to see you now, then.
CHALLENGER Yes, we're also in darkness.
AMERICA That's orange, you sure you got your track-
ing light up?
CHALLENGER That's affirm. I can see it flashing.
We do have our tracking light on.
AMERICA See it flashing?
CHALLENGER Yes, I see a reflection on - -
AMERICA Ah, I see - can't see you in the telescope
but I got you right in the sextant.
CHALLENGER Good. Outstanding babe.
CAPCOM Challenger, Houston. No update on your
LM weight.
CHALLENGER Okay, understand. No update on the weight.
AMERICA And Houston. I'm going to accept that
because he was about one degree almost an inch of the sextant.
CHALLENGER Houston can you tell Challenger what's
wrong with the high gain.
CAPCOM Stand by Challenger for America to go
ahead and accept that one.
AMERICA Okay, broght him right in. This is
America, broght him right into the center.
CAPCOM Challenger, Houston. Jack if you have a
free moment you might try the steerable again. Pitch 120
yaw minus 70.
CHALLENGER Okeydoke, Gordie, 120 and minus 70.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/14/72 GET 188:28 CST 17:22 MC757/1

CHALLENGER And. Okay, Houston, that's auto on the high gain. How do you read me?

CAPCOM Jack, you're loud and clear. Looks good.

CHALLENGER Gordy, I don't know what broke lock. Did you read us all through ascent. We had some uplink signal strength.

CAPCOM That's affirmative. We read you loud and clear all the way. We haven't figured it out either.

CHALLENGER Okay, we had a loud uplink squeal on all

CAPCOM Roger.

CHALLENGER On all, on OMNI's as well as high gain.

CAPCOM Roger.

CHALLENGER That's steerable. Excuse me. Okay Gordy, Challenger's state vector is locked in with the raw data. We've got twelve marks going for us now.

CAPCOM Roger.

CHALLENGER And Houston, can we have an LOS time, please?

CAPCOM Yes. Stand by. Challenger, LOS should be

188:51:15.

CHALLENGER Roger. 51:15.

PAO This is Apollo Control. We now show America leading Challenger by about 78 nautical miles. The two vehicles closing at about 300 feet per second. And we have about 21 minutes now remaining before we lose contact with the Command Module and we'll lose the LM, which is in a lower orbit about 1 minute earlier than that. Shortly after disappearing behind the Moon and shortly after we lose radio contact with the two vehicles, they'll be performing the terminal phase initiate maneuver from the Lunar Module. That will be a burn using the ascent propulsion system engine, a 3500 pound thrust engine imparting an increase in velocity about 74.7 feet per second. This maneuver will place the LM on an intersecting trajectory with the CSM for rendezvous.

CHALLENGER America, Challenger. We got you now just under 72 miles and we're 279 feet per second closing.

AMERICA Okay, got you. 71 miles.

AMERICA Hello Challenger, America. You still there? I lost all my noise.

CHALLENGER Affirmed. We're still here.

CHALLENGER And we're on our flight. We're coming right up beside you.

CAPCOM Challenger, Houston. For your information, the (garble) that we, that you probably saw during ascent was, we think, in the PNGS. The AGS is okay. It's probably a slight juice up to the rear of the PNGS.

CHALLENGER Okay, Gordy. Understand.

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CAPCOM Challenger and America, Houston. If that noise, which is due to low signal strength on America is bothering anyone, we could break down the relay and let you talk to each other VHF. Over.

CHALLENGER Yes sir Houston. This is Challenger. Let's break down the relay and America, let's go VHF.

CAPCOM Okay.

AMERICA Okay, America. I'm on VHF.

CHALLENGER Okay, good.

CHALLENGER Okay, Houston. We have America on VHF.

CAPCOM Roger.

AMERICA I still got your echo there Challenger. This is America.

CHALLENGER Okay.

CHALLENGER Gordy, you want to give us an explanation of the ascent engine garble) problem.

CAPCOM Let me get that story myself. We're still looking at the data. Try to have one for you before we lose you at least the next time around we will.

CHALLENGER Okay. Yes. Go ahead.

CHALLENGER Go ahead.

CHALLENGER How many marks you got?

CHALLENGER 35.5. Okay. Go ahead.

CHALLENGER Go. Go.

CHALLENGER Well, I'm not very at Z. 15 feet per second difference. But it agrees with the AGS, if that makes you feel any better.

CHALLENGER Hello, Houston. You were looking at our NOUN 81 on the recycle. That's 17 marks.

CAPCOM Roger, Challenger. And what it was on the APS there we saw an indication, probably due to a temperature shift, which was a possible indication of unbalanced of propellant usage there. And it was sort of confirmed by an increase in the (garble, garble, garble), so we just played the conservative thing and terminated ascent speed.

CHALLENGER Okay, Gordy. Thank you. I was just curious as to exactly what it was.

END OF TAPE

CHALLENGER Okay, Gordie. Thank you. I was just
curious exactly what it was.

CAPCOM Okay, and it's no problem for our TPI on the APS.

CHALLENGER Understand.

AMERICA Okay, Challenger, America. I got the
NOUN 81 for you to recycle.

CHALLENGER Okay.

CHALLENGER I agree with you pretty well.

CAPCOM Outstanding.

CHALLENGER Ron, I say TPI is about 4.9 off 5 feet
per second.

CAPCOM America, Houston. Let's try the high
gain, pitch zero, yaw 30, manual and wide and leave it in
manual.

AMERICA Who relayed to me? I can't hear 'em
(garbled).

CAPCOM Challenger, Houston.

CHALLENGER Go ahead, Houston. This is Challenger.

CAPCOM Okay, would you relay to America to try the high
gain, pitch zero, yaw 30, manual and wide.

CHALLENGER You want pitch zero, yaw at 30, manual
and wide. That's pitch zero, yaw 30, manual and wide.

CAPCOM Yeah, that's affirmative.

AMERICA (garbled)

CHALLENGER Okay, Houston. He's still working at
it.

PAO This is Apollo Control at 188 hours
39 minutes. The noise we're getting on the communications
circuits right now is coming from the CSM link and we
hope to improve that by getting the command module in
operation on it's high gain antenna, which will increase
our signal strength and should cut down the noise quite a bit.

CAPCOM Challenger, Houston, over.

AMERICA Houston, America. How do you read me?

CHALLENGER Go ahead, Houston. This is Challenger.

CAPCOM Okay. Standby. America we just barely
read you. Go ahead.

AMERICA Okay, just a second, I can read you
loud and clear now.

CAPCOM Okay, you're readable. For Challenger.
The MSFN V was kinda weak. We're expecting more like a
plus 20 for the Delta V - V solution for TPI and that's
what all the airborne systems seem to be converging on. Over.

CHALLENGER That sounds right. We prepared that
way up here. Glad to hear that. Thank you.

CAPCOM Roger.

PAO The numbers that the crew aboard Challenger will use for the TPI or Terminal Phase Initiate maneuver are generated on board. The numbers from the ground are used as backup.

CHALLENGER Pipe line coming right up the pipe.

AMERICA Okeydoke. Sounds great.

AMERICA (garble) I got you 49 miles out.

CHALLENGER Okay.

PAO Challenger's radar shows the LM now 49 miles behind the CSM, closing at the rate of 178 feet per second. And we have about 10 minutes now until loss of radio contact as the vehicles go behind the Moon. About 13 minutes 25 seconds until TPI initiate.

CHALLENGER Okay. I'll check it again pretty quick but at the - have the running lights and the rendezvous lights on.

CAPCOM Challenger, this is Houston. If you loose the steerables, get near blockage, go to aft OMNI.

CHALLENGER Roger.

AMERICA Okay, Challenger, America. They both checked on. I checked the circuit breakers.

CHALLENGER Yeah, they are both here and I (garble).

AMERICA (garbled) I just started picking you up in the telescope.

CHALLENGER (laughter) You're going to sleep with them, they're to big.

AMERICA I don't care what you look like, come on back. I was going to shave and look nice for you, but I didn't have time to shave either. So -

PAO That's Ron Evans aboard America that we're hearing right now.

AMERICA Yeah, I heard you lost a couple fenders or something.

END OF TAPE

CHALLENGER I'm with you I'm already in final call.
CHALLENGER Your what? Let me double check it. 188 55
5700. We're lucky (laughter). That's right. Okay, you
ready to copy my 981s. Minus 75.9 minus 4.8 -

CAPCOM Challenger, Houston, we'd AFT OMNI now.
CHALLENGER And Z is a minus 17.6.
AMERICA Okay, copy correctly. I'll maneuver to
TPI attitude.

CAPCOM America we'd like NARROW and REACQ on
the high gain.

CAPCOM Challenger, Houston. We see you heading
toward gimbal lock, over.

CHALLENGER No you don't I'm just rolling yawing.

CAPCOM Okay, let me check back on that call,
sorry.

CHALLENGER Yes, this is just normal procedure. I'm
rolling 180.

CAPCOM Okay, we're about 2 minutes to LOS. All
the solutions look good to us. I guess if we apply the
voting logic we go with the PGNS. Over.

CHALLENGER Okay, we've already decided that we are
going to go with the PGNS. All the solutions look good on
our onboard comparisons, Gordo.

CAPCOM Roger.

PAO This is Apollo control. We've had loss
of signal now from the LM and about 1 more minute we'll lose
contact with Ron Evans aboard the command module America. As
the two vehicles go behind the Moon on the 51st revolution.
Challenger, will be performing the terminal phase initiation
maneuver in about 4 minutes 30 seconds. This maneuver com-
puted onboard and the time of ignition and ground elapsed
time will be 188 hours 55 minutes 57 seconds. This burn
again performed with the ascent propulsion system engine a
very short burn between 2 and 3 seconds in duration. And
when last we had data from the lunar module radar it showed
Challenger 39 miles behind America closing at a rate of about
a hundred feet per second. And we've had loss of signal now
from the command module. We'll be reacquireing vehicles in
about 45 minutes. And at that time Challenger should be
closing with America going through the final breaking prior
to station keeping leading up to docking. The following is
a statement from the President of the United States of America.
As the Challenger leaves the surface of the Moon we are
conscience not of what we leave behind, but of what lies be-
fore us. The dreams that draw humanity forward seem always
to be redeemed if we believe in them strongly enough and
pursue them with diligence and courage. Once we stood

PAO mystified by the stars today we reach up to them. We do this not only because it is mans destiny to dream the impossible, to dare the impossible and to do the impossible. But also, because in space as on Earth there are new answers and new opportunities for the improvement and the enlargement of human existance. This may be the last time in this century that men will walk on the Moon, but space exploration will continue. The benefits of space exploration will continue. The search for knowledge through the exploration of space will continue, and there will be new dreams to pursue based on what we have learned. So let us not mistake the significance nor miss the majesty of what we have witnessed. Few events have ever marked so clearly the passage of history from one epoch to another. If we understand this about the last flight of Apollo then truly we shall have touched a many splendored thing. To Gene Cernan, Jack Schmitt and Ronald Evans we say God speed, and safely back to this good Earth. This statement will be available in the MSC news center.

END OF TAPE

PAO This is Apollo Control at 188 hours 59 minutes. About 2 minutes 45 seconds ago, Challenger should have performed the terminal phase initiation maneuver that will put the LM on an intersecting trajectory with the Command Module. We would like to recapitulate the lunar liftoff which was nearly normal in all respects. The liftoff occurred at Ground Elapsed Time of 188 hours 1 minute 36 seconds and shut down occurred 7 minutes 20 seconds, both as predicted. The onboard guidance system, the primary guidance system of the LM calculated an initial orbit of 48 by 9 nautical miles. Correction of 50 by 9 nautical miles, and on the ground we calculated an orbit agreeing very closely with that of 48 by 9. The CSM at this time in an orbit 62 nautical miles circular, nearly circular. There was a period of time during the early phase of the liftoff, at pitchover, which occurs at about 10 seconds when we lost tracking data. This loss of data lasted for about 3 minutes. Now later in the powered ascent, there was a period of time when the crew aboard Challenger was not receiving voice communications from the Control Center, although we were receiving communications from the LM and we were relaying messages through the Command Module to the Lunar Module. And we don't have an assessment of what caused that problem at this time. We expect to get further information on that later. We'll be reacquiring the vehicles in about 35 minutes as they come back around on the front side of the Moon on the 52nd revolution for the Command Module, America. At 189 hours 1 minute, this is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control at 189 hours, 34 minutes. We're about 2 minutes now from reacquiring the spacecraft, America and Challenger. At the time we reacquire, the two vehicles should be about 7 miles apart with Challenger behind and below the Command Module, closing at the rate of about 5 feet per second. As they pass out over the front side of the Moon, approaching the landing site at about 190 hours ground elapsed time, they should be in position for docking. And we expect to have television of that event. Docking is unlike some trajectory events not constrained to occur at a specific time, but depends on when the crew feels that they have everything aligned up properly and in a position to move in and dock. But we would expect that we would be fairly close to that time of 190 hours ground elapsed time.

AMERICA Okay, Houston. America here.

CAPCOM Roger, America. You're loud and clear.

AMERICA Okay, do you have me on the tube.

CAPCOM Not yet, Ron. I'll let you know.

PAO And we have a good television picture.

CHALLENGER Okay, Houston, we are reading you loud and clear, we're at 1 mile and I just broke into 30 feet per second. TPI was nominal.

CAPCOM Okay, Challenger, that's good news.

CHALLENGER Okay, and the midcourses were all less than 1.6 feet per second and we're at .8 miles now, 5000 feet.

CAPCOM Roger.

CHALLENGER Okay, our next breaking gate, is 3000 feet.

CHALLENGER Ron, I've got a plan form, I can see the Command and Service Module now.

AMERICA Okay.

CHALLENGER We are at 4200 feet and 30 feet per second. And inertial line of sites are both 0.

CAPCOM America and Challenger, this is Houston. We've got a good picture of the Challenger coming up from the surface of the Moon.

AMERICA (Laughter) It's coming straight up, all right.

CHALLENGER Okay, Ron. Coming up to 3000 feet, I'm going to break off to 20.

AMERICA Okay.

CHALLENGER Hold on, here we go.

CHALLENGER And, we're 2500 feet and 20.7 feet per second.

CHALLENGER 15 on 110.

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CHALLENGER Got you centered in the needles, Ron.
AMERICA Okay, you're looking good.
CHALLENGER Coming up at at - under 114 - 116 degrees.
1900 feet 20 feet per second.
AMERICA Okay, quarter of a mile, I got you.
CHALLENGER I can see your thrusters firing now,
Ron. We're at 1500 feet and breaking.
AMERICA Okay.

END OF TAPE

CHALLENGER Okay, Ron, we're at 1200 feet and 8.8 feet per second.

AMERICA Okay, that's about right. Concur.

CHALLENGER Yeah, you do have a stub of an antenna out there on the same side as the VHF antenna's on.

AMERICA Yeah, how far is it sticking out?

CHALLENGER I can't tell yet, but about -- from where I am, about a third of the way -- a third of the length of the VHF antenna.

AMERICA Oh, that's not very far.

CHALLENGER No. Okay, we're at 970 feet. 800 feet and we're at 8.8 feet per second.

AMERICA Looks like Challenger's in good shape. I don't see anything hanging down or anything.

CHALLENGER She's in excellent shape. Okay, we're at 650 feet and 8.8.

AMERICA Okay.

CHALLENGER God, you look pretty. Yeah, you just got a small stub, Ron. Probably not more than a couple of feet.

CHALLENGER 600 feet, breaking to 5.

CHALLENGER Okay, I've got 5.0, and I'm at 520 feet.

CHALLENGER Ron, I'm closing at 5 feet per second, 440 feet.

AMERICA Okay.

CHALLENGER Good to see you.

AMERICA Good to have you all back up here.

CHALLENGER It's been a good trip. Staying at 5 feet per second and 350 feet.

PAO Challenger's coming in with the crew in the -- nearly heads down position as seen on the television monitor.

CHALLENGER Just great. Okay, Ron, 240 feet and 3 feet per second.

AMERICA Okay, keep her coming. Nice and easy. Getting lots of pictures.

CHALLENGER 200 feet, 3 feet per second. I got 2 feet per second, and I'm at 170 feet.

CHALLENGER 140 feet and 2 feet per second. About three feet of that antenna Ron, and we'll get a better look at it when you pitch over.

AMERICA Okay.

CHALLENGER Everything else looks clean.

AMERICA That Challenger's a beautiful vehicle.

CHALLENGER You betcha.

AMERICA One little strap flapping on the top of it, and that's all.

CHALLENGER Okay, I've got 2 feet per second, I'm at 100.

AMERICA Hey, Houston. You can see that strap flopping up there now on the TV, but that's the only thing.

CAPCOM Yeah, Ron, we haven't picked it out, but we do have a perfect picture.

CHALLENGER Ron, I'm sneaking in at about a little over 1 foot per second.

AMERICA Okay, I'm trying to keep you on the tube here, so --

AMERICA (Laughter) How come you guys do everything upside down?

CHALLENGER Okay, let's let it drift in like this slowly.

AMERICA Okay. You still have it.

CHALLENGER I've still got it.

CHALLENGER Ron, I'm going to stop it here, and you can do your maneuver.

AMERICA Okay.

CHALLENGER Okay, I'm station keeping on you.

AMERICA Okay, I'll do my VERB 49.

CHALLENGER Seem okay, Jack?

CHALLENGER Oh, I gotta get a picture here, too.

CHALLENGER Okay, will do, stand by.

CHALLENGER Took a couple of pictures here. Got 'em.

253 -- 319, 254, and zoom.

CHALLENGER Okay, you ready, Jack?

CHALLENGER (Garble)

CHALLENGER Okay, here we go. Mark it. In a minute.

CHALLENGER Yeah, I'm going to get the radar out of the way, but I'm not going -- I'll lose him here as soon as his (garble) gets out.

CHALLENGER I want to just station keep.

CHALLENGER Roger, probe looks good. I can see it extended.

AMERICA Okay, great.

CHALLENGER Radar holds you -- well, we don't hold you anymore.

PAO Ron Evans will now maneuver the CSM into position for the final docking.

CHALLENGER Radar's being stowed now, Ron.

AMERICA Okay.

CAPCOM America, we'd like OMNI Delta, please.

CHALLENGER Houston, America and Challenger -- a good tight Navy formation.

CAPCOM Roger, Geno.

PAO We've switched to one of the OMNI directional antennas on the command module, and we won't have television back until we get back on the high gain antenna, which should be shortly.

CHALLENGER Antenna is nothing more than your EVA light out there.

AMERICA (Laughter) Okay.

CHALLENGER From where I was, it looked like it was coming out the other side, but I think you're clean.

AMERICA Okay. But, now the one I'm concerned about is on the side from the EVA antenna.

CHALLENGER No, uh uh, you were clean over there.

AMERICA Oh, okay.

AMERICA The bottom of your vehicle's got a bunch of tinfoil on it, it's a little bit scorched, but it's all intact, as far as -- much as I can tell.

CHALLENGER This bird is good enough to fly again.

CHALLENGER Yes sir. I'll even (garble).

END OF TAPE

CHALLENGER How (garble, garble)
AMERICA I got 60 per cent left.
AMERICA Say I like to fly.
CHALLENGER You in your maneuver, Ron?
AMERICA Yes. It's maneuvering now.
CHALLENGER Okay, I'm going to go ahead and take a peak
at your SIM bay up here.
AMERICA I know.
PAO Our instrumentation and communications engi-
neer estimates that it will be 10 to 12 minutes before reposition
to get the high gain antenna and television back.
CHALLENGER Film okay, Jack. Film okay.
CHALLENGER Okay, we're getting pretty close now. About
another 5 degrees roll is OFF. Can you see it?
CHALLENGER Yes.
CHALLENGER How does the mapping camera look? Should be
all covered up.
CHALLENGER Stand by.
CHALLENGER Okay.
CHALLENGER I think I'll fly over there and take a look
at it.
CHALLENGER Okay.
CHALLENGER Sun's shining right in it.
CHALLENGER Okay, Ron. It looks intact here. There's
one cover.
CAPCOM Challenger, Houston. Over.
CHALLENGER It's got a cover on the right hand side.
CHALLENGER Go ahead.
CAPCOM We'd like you take a special look at the pan
camera and see if you think maybe the lens is not completely
stowed. Over.
CHALLENGER No ah, I'm looking at this thing upside down.
There's the sub, give me the location again of the pan camera
Houston.
CAPCOM It's a round barrel type object, approximately
right in the center of the SIM bay.
CHALLENGER It's just, if you're standing in the shoes,
the pan camera would be right in front of you.
CHALLENGER It's stowed, it's flush.
CHALLENGER There's one door open, Ron. If you were
standing in the shoes it's at the bottom hand, bottom left
hand side of the SIM bay.
AMERICA Bottom left hand side, you're standing in
the shoes.
CHALLENGER Yes. It looks like two covers open there.
Doesn't it Jack.
AMERICA Yes. Okay, well that's part of the mapping

AMERICA camera, bottom of that door that pushes open by itself.

CHALLENGER Okay, well that's the only thing that's open. Everything is flush.

AMERICA Okay, you think, is that a door that extends, if you're standing in the shoes, that extends out the bottom of the SIM bay or one that extends out, if you're standing on the shoes, extending on the left side of the SIM bay?

CHALLENGER Yes. It extends out the left side toward the front of the spacecraft down in the bottom left hand corner, if you're standing in the shoes.

AMERICA Yes. Okay. Yes that's the one that the camera pushes open by itself.

CHALLENGER Okay. Well that's good. I can't see anything that's abnormal down there. Everything's covered, everything's flushed.

CAPCOM Challenger, Houston.

CHALLENGER Okay.

CAPCOM Challenger, Houston. Over.

AMERICA Houston, were you calling America?

CHALLENGER Go ahead.

CAPCOM Some more words on identifying whether the pan camera is stowed or not. The pan camera, as Ron said, is right in front of the shoes. And if it's stowed, well if it's not stowed properly, you should be able to see the lens or probably part of it. And if it's fully stowed there'll be just a plain faced barrel facing outward. Silver colored. Over.

CHALLENGER It's stowed, Houston.

CAPCOM Okay. It sounds good.

CHALLENGER It's got to be. There's nothing, it's stowed.

CHALLENGER Let me take one more look.

CHALLENGER The only thing abnormal is the service module plates, just forward plus next to the SIM bay are all blistered. It's forward of those EVA hand holds.

CAPCOM Roger. We copy that. Our concern, or the reason we're asking about the pan camera is we have a higher than normal temperatures in the pan camera and we were concerned whether it was either not completely stowed or maybe there's a heater stuck on. We'll check a heater out later on here.

CHALLENGER I'm going around the other side here a little bit, but it's. We have a long barrel, through the center down the XX axis, deep into the SIM bay, then you have a little barrel oh about 3 inches, 2 or 3 inches, like about a 500 millimeter lens on a Hasselblad, sticking straight up, perpendicular to SIM bay and it's well flushed. It's inside the box that it's next to.

CAPCOM Okay, Jim.
CHALLENGER Yes. It's normal. There's nothing that's unstowed in that thing.
CAPCOM Challenger, America, that's good on the inspection from questions from here anyway. Clear to continue and proceed with docking.
CHALLENGER Okay.
AMERICA It is unbelievable.
CHALLENGER This is the greatest flight in the world, Ron.
AMERICA Can you see me.
CHALLENGER Yes, I can see you. Right in there.
CHALLENGER Reach out and tickle your probe.
AMERICA Okay.
CHALLENGER Okay, let's get, let's get this business going. Let's get in a docking attitude.
AMERICA Okay, we'll maneuver to the docking attitude here.
CHALLENGER Ron, I can also see where your HF comes out on this side, and it's flush with the box. It's completely stowed.
AMERICA Okay, well that's the one that we think hid the one on that side, the other side is the one that we are a little concerned with. We don't worry about it.
CHALLENGER It's so true.
AMERICA Oh, Okay.
CHALLENGER We were over there.
AMERICA Okay.
AMERICA And I'm maneuvering back to a docking attitude.
CHALLENGER Your high gain is not pointing at the Earth, though, I don't believe.
AMERICA Oh, we're not using it yet. It's pointing where the Earth will be when we maneuver back around.
CHALLENGER Okay.
AMERICA Another one from there.
CHALLENGER I'd try 11 and 8. That's what I'm doing.
CHALLENGER Right.
CHALLENGER We took a punch (garble).
CHALLENGER Guess I ought to pull my radar breakers, now that it's stowed.
AMERICA Okay, Houston, can you see my logic yet. Or you want to wait until the high gain? This is America.
CAPCOM Oh, we can see it now Ron. We can do it now.
AMERICA Okay, Logic 1. Mark it. Logic 2. Mark it.
CAPCOM Ron, you're GO for pyro 1.
AMERICA Okay.
CHALLENGER Backing off here a little bit Ron. Give you a chance to maneuver.

END OF TAPE

CHALLENGER Hey Jack, what are we forgetting. Let's see the high gain or the rendezvous radar is stowed and as soon as he gets his attitude I'll get to mine.

CHALLENGER Looks like you've been flying well up there pardnor. The spacecraft looks good.

AMERICA Oh, you betcha.

CHALLENGER How, far you got to go on your maneuvers?

AMERICA About another 60 degrees of roll, yet, and about 10 degrees pitch.

PAO Ron Evans now maneuvering America into position for the docking. The final few feet of the docking maneuver performed with the command module because of the better visibility from that vehicle.

CAPCOM Give us OMNI alpha.

CHALLENGER Okay, Ron I can confirm your other HF antenna is stowed.

AMERICA Okay, good, thank you.

AMERICA Okay, the PYRO's are on.

AMERICA Sorry, but I'm out of film in the DAC. You guys will just have to -

CHALLENGER No problem.

AMERICA - be on TV (laughter).

CHALLENGER No problem. Let's just get in attitude and get those capture latches in that drogue.

AMERICA Okay.

CAPCOM Ron, the high gain angles look good. Go NARROW and REACQ and we should have you.

AMERICA Okay. I'm in attitude Gene.

CHALLENGER Okay, let me position so I can get in attitude.

CAPCOM And America and Challenger we got a beautiful picture once again.

CHALLENGER Very good Gordie we're happy to give it to you. This worked out great Ron.

AMERICA Yes, it sure did.

CHALLENGER Null PGNS and then I'll give it to you shortly.

CHALLENGER Okay, Ron you've got it.

AMERICA Okay.

CHALLENGER Okay, you've got it I'm going into my maneuver.

AMERICA I've got it.

CHALLENGER And that's the landing site down there. We pitched right through the landing site.

AMERICA We did.

CHALLENGER Yes.

AMERICA Well good. (Laughter).

AMERICA Look at your -
CHALLENGER No, don't get (garble).
AMERICA Yes, (laughter).
AMERICA Well, the drogue is still in there.
CHALLENGER Okay, I've got you right off the overhead,
Ron, now I'm going to yaw.
AMERICA Okay, yaw her around.
CHALLENGER Okay, here we go. What a super flying
machine.
AMERICA Still looks kind of tinny to me.
CHALLENGER He's not going to have to do anything,
but thrust right into - I might even get your roll angle
zero for you by this maneuver. Okay, it's all yours.
AMERICA (Laughter) okay I've got her.
CHALLENGER Should be looking - I'm looking right up
your window.
AMERICA I got to translate through sideways a
little bit here. The trouble is I'm looking right into the
Sun.
CHALLENGER Yes. Change these focus to 60. Okay,
Jack let's go over that thing again. We got anything else
to do.
CHALLENGER Well, you're at the attitude. We're
waiting to confirm capture and then you just mode control
off.
CHALLENGER Let me get out of the way.
CHALLENGER We can do it babe, keep it coming.
AMERICA Okay, she's looking alright.
CHALLENGER Command module looks just as good as the
day they put it on the pad.
AMERICA And you know so does Challenger by gosh.
Your missing some of the pieces.
CHALLENGER Yes, one big piece we left behind.
CHALLENGER Yes, right.
CHALLENGER Ron, I guess I'd estimate you about 12 or
15 feet.
AMERICA Yes, that's about right.
CHALLENGER Got my reticle coming right in the ren-
dezvous window.
AMERICA Okay, she ought to be coming right in
there.
CHALLENGER Looking good, you're stable as a rock.
CHALLENGER Bet I'll be able to get it with that.
CHALLENGER Give me a little warning on capture Ron,
so I can go free.
AMERICA Okay, try to.
CHALLENGER I can see all your docking latches. I
can see half of them now but their all looking good.

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AMERICA Okay.

AMERICA Coming in nice and slow no problems.

CHALLENGER Okay, you're looking good babe. I got
down my COAS right up in the middle of the window. Looking
good. Looking good.

AMERICA Okay.

CHALLENGER Must be a couple of feet away. About
2 or 3 feet is all.

END OF TAPE

AMERICA Stand by Jack. Stand by. Should be
Getting about the same size.
CHALLENGER Looking good from here, Ron.
AMERICA Stand by.
AMERICA Ought to have it here.
CHALLENGER Okay, then get it - One second.
AMERICA Okay, you didn't get it.
CHALLENGER Didn't get it. Okay, might have been a little
bit slow.
CHALLENGER Stand by.
AMERICA You got (garble) go free.
CHALLENGER Good, start here, we're free.
CHALLENGER We're free over here. Let me check
the rates. Okay, I'm squared away the rates here.
AMERICA All you need was a little more Delta V.
A little more.
CHALLENGER That looked good though, Ron. Very good.
AMERICA Okay. That's a good one.
CHALLENGER Okay, Houston, we have capture. Okay,
you ready -
AMERICA (garbled).
AMERICA A little bit - not lined up here.
CHALLENGER What'd you say, Ron? We're not quite lined
up here. Kind of drifted off a little bit.
CHALLENGER Okay, we'll stand by for you.
AMERICA Kind of drifted off a little bit.
CHALLENGER Okay, we'll stand by for you. Take your
time.
AMERICA Okay. Will do. Okay, she's coming back
around.
CHALLENGER Take your time.
CHALLENGER We're still free, Ron.
AMERICA Yeah, I know.
AMERICA Okay.
AMERICA Yes, when you're free, know you create
a little bit of rates on the thing too.
CHALLENGER I know it. I can see that.
Just take your time when you're satisfied. go, but don't go
until you're satisfied.
AMERICA Okay, I won't.
PAO The soft dock mechanism between the
two vehicles has engaged. Evans is in the process now of
trying to get things lined up properly, before pulling the
LM and CMS together into the hard docking.
AMERICA Okay, she's coming back around now.
CHALLENGER Okay, give me a call when you start to retrack.
AMERICA Okay, will do.

PAO Gene Cernan should be visible behind
that window in the top of the lunar module.
AMERICA Crazy thing.
CHALLENGER Say again. (Laughter).
AMERICA I get the (garbled) goes around the
other way.
AMERICA I think you're bouncing around up there
too, you know.
CHALLENGER I know. I'm just swinging free.
AMERICA Yeah. (garbled)
AMERICA I think you're going to have to go down
below, you're bouncing around more (garbled). I'm not
moving at all.
CHALLENGER Okay. Stand by, Ron.
AMERICA Okay.
CHALLENGER Okay, I'm stable now.
AMERICA Okay. Now let me come up to you.
CHALLENGER When you're happy, I'll go free.
AMERICA Okay, stand by. Looking good now.
CHALLENGER Looking good, yeah. Yeah, that's what
we needed.
AMERICA Okay, she's looking good.
CHALLENGER Let's go to free, and we'll go to re-
track 1.
AMERICA Okay, mark that. Free.
CHALLENGER Okay, retrack. Here he comes. Bang,
good old two barber poles.
AMERICA You got what?
CHALLENGER Okay, (laughter) just great - I mean -
That's better. (garbled).
AMERICA Okay, sounded good, in here.
CHALLENGER Okay, Houston, we're hard docked.
AMERICA Okay, (garbled).
CAPCOM Roger, understand. 2 (garbled).
AMERICA Circuit breaker is open. 2 gray, that's
affirm.

END OF TAPE

CAPCOM Challenger, Houston. We'd like to bring up the steerable here, pitch at 155, yaw plus 40.

CHALLENGER Roger. 155 and plus 40.

CAPCOM Affirmative.

CHALLENGER Say again, Gordy. 155?

CAPCOM A pitch of 155 and yaw plus 40.

AMERICA Okay, Gene, you still free?

CHALLENGER That's affirm. I'm still free.

AMERICA Okay. I'll take control of it.

AMERICA Okay, Gordy, there's the high gain.

CAPCOM America and Challenger, you're ...

CHALLENGER Hey, Gordy, we're not ...

CAPCOM Like to take a minute of your time here to read the following statement by the President of the United States of America. As the Challenger leaves the surface of the Moon, we are conscious, not of what we leave behind, but of what lies before us. The dreams that draw humanity forward seem always to be redeemed if we believe in them strongly enough and pursue them with diligence and courage. Once we stood mystified by the stars. Today we reach up to them. We do this not only because it is man's destiny to dream the impossible, to dare the impossible, and to do the impossible, but also because in Space, as on Earth, there are new answers and new opportunities for the improvement of ... Last time in this century that men will walk on the Moon, but Space exploration will continue. The benefits of Space exploration will continue and there will be new dreams to pursue, based on what we have learned. So let us not mistake the significance or miss the majesty of what we have witnessed. Few events have ever marked so clearly the passage of history from one epoch to another. If we understand this about the last flight of Apollo, then truly we shall have touched a many splendedored thing. To Gene Cernan, Jack Schmitt, and Ron Evans, we say God speed you safely back to this good Earth.

CHALLENGER Gordon, those are beautiful words by a great American president. We're very honored to receive them, we're very honored to be able to serve our country in the way that we believe in. And we thank you. Thank you very much Gordy, and Mr. President.

AMERICA Mr. President, this is America and we appreciate it very much. Thank you sir.

CHALLENGER Say, Houston, Challenger.

CHALLENGER Ron, would you give us a call, when the tunnel's pressurized?

AMERICA Okay. Stand by.

CHALLENGER And also, we'll need a call when you get the attitude.

AMERICA Okay. Will do.

AMERICA Okay, your dump valve is in auto?
CHALLENGER Yes sir. It's in auto.
AMERICA Okay, jet fans are on for the first time
in the flight.
AMERICA I got to get down there and turn the tunnel
(garble).
AMERICA Okay, emergency cabin (garble) are off.
CHALLENGER Houston, Challenger.
CAPCOM Go ahead, Challenger.
CHALLENGER Roger. Give us a call when you want us to
go through the COMM configuration, and we're going to leave the
cabin fan on a little bit, keep airing out, filtering the cabin.
And don't let us forget it.
CAPCOM Okay.
AMERICA Okay, Houston. I'm going to open the pressure
equalization valve going into the tunnel. Can you keep an eye on
my cabin pressure?
CAPCOM Roger, America. Will do.
AMERICA Okay.
AMERICA Okay, there's 2. Delta P is 2. Back closed
and see if it stays.
CAPCOM America, Houston. You need a PRO to get the
V49 maneuver to jet attitude starter, don't we.
AMERICA Oh, sorry. (garble).
CAPCOM Ron, while you're down there, there's a cou-
ple switches on the SIM bay to check out this pan camera heater.
Over.
AMERICA Sure go ahead. (garble)
CAPCOM Okay. Pan camera mode switch to stand by.
And the pan camera power switch to power.
AMERICA Verify. Stand by.
AMERICA Pan camera power is going to power now.
CAPCOM Okay, that's good. We'll take a look at it
a while and let you know when we want power off.
AMERICA Okay.

END OF TAPE

CHALLENGER Okay looks like pressure is holding good, there.

CAPCOM Challenger, Houston.

CHALLENGER Pressure is okay, we'll go ahead and take her on down. Go ahead.

CAPCOM Okay, when you get ready to transfer an OPS. We want you to transfer the commander's OPS. Over.

CHALLENGER Okay, we'll do.

CHALLENGER Gordie, were you able to see the lunar surface liftoff?

CAPCOM Yes sir, we certainly were. It was a beautiful picture and captain video stayed right on you. We saw you up to about two minutes into the burn. We could see the flow.

SC Oh, I'll tell you. If Challenger hits that south massif and you're anywhere pointing in the right direction you ought to have a spectacular shot.

CAPCOM I'm sure of that because that camera is as good as any I've seen in a television studio.

SC Okay, I've got about .2 on the Delta P. And the equalization valve's wide open so it must be about right.

SC Okay, emersion cabin pressures (garble)

SC Okay, we're going to open the hatch.

SC Ron, do you read?

SC What?

SC Yes, go ahead.

SC Okay.

SC Yeah, I still got about five on the cabin I think. I got the hatch out yes, it's pressurized. Okay.

SC Okay, Ron it'll be a minute or two before we open that hatch. We got a little work to do in here.

SC I don't know what it's like (laughter).

I guess it's great. Let me check the old docking latches.

SC Okay,

SC Okay, I hear you. And Houston, every latch worked perfectly.

CAPCOM Roger.

SC Okay, let's get the probe out of here.

SC I'm just bleeding the nitrogen out of the probe.

CAPCOM Roger, Ron and when you get back in the cabin next, we'll take pan camera power off.

SC Okay. The probes loose in there.

CAPCOM Sure sounds like it.

SC Is there any hurry on that Gordo?

SC Houston, this is America. Is there any hurry on that pan camera thing? If not I'll take the probe out.

APOLLO 17 MISSION COMMENTARY 12/14/72 CST 19:21 GET 190:27 767/2

CAPCOM Negative, no hurry we have plenty of
time here till LOS 14 minutes we want to see it before then.

SC Okay, I'll get it out before then.

PAO Evans will now remove the probe and
drogue assembly and hand them through to Jack Schmitt and
Gene Cernan in the lunar module. He'll also be transferring
in the vacuum cleaner and a list of other items that need to
be transferred out of the LM into the command module. After,
everything is cleaned up as possible in the LM cabin the
crew will begin transferring samples and other equipment
into the command module and getting - begin the process of
getting transferred themselves from Challenger into America.
We have about 13 minutes remaining before we lose radio
contact with Apollo 17.

END OF TAPE

CHALLENGER (garbled)
AMERICA There comes the old probe.
CHALLENGER (garbled)
AMERICA Okay, the probe is out.
CAPCOM Roger, Ron.
AMERICA Hey, does that - do you want the probe
right away, Jack?
AMERICA Do you want the probe right now?
CHALLENGER (garbled)
AMERICA Okay.
CHALLENGER (garbled)
AMERICA Okay, Gordy, pan camera power is OFF.
CAPCOM Okay, Ron, and before you pass the
transfer list out of the Flight Plan Supplement, we have
two small changes to page 1-11.
AMERICA Okay, wait one and I'll get it. Okay,
I'm on 1-11.
CAPCOM Okay, Ron.
AMERICA Naw, that's it.
CAPCOM Item 17. Just change the last part of
the statment "stow on A-1" to "stow on A-7", and on item 19
there, change from "stow on A-7" to "stow on A-1". That's
it.
AMERICA That's it? Okay? We can do that I think.
CAPCOM Okay.
AMERICA Hey, here he comes. By God. How you
doing? (laughter) Beautiful. You're a joke.
CHALLENGER Boy, is it cool up here. It's hotter
than hell down here. It's stuffy.
CAPCOM America advised we're reading all of you
on Ron's watch.
AMERICA (laughter) Okay.
CHALLENGER Let je just double check all (garbled)
CAPCOM Jack, if your (garbled) won't take the
S-band reconfiguration now.
AMERICA Okay, I'll do that.
CHALLENGER (garbled)
AMERICA Okay, Houston, how do you read on the
aft OMNI?
CAPCOM Loud and clear Challenger on the aft OMNI.
CHALLENGER Here's your old vacuum cleaner. (laughter)
AMERICA You (garbled) No. it's not on.
Want it on? (laughter) Great. Hey, let me know when you
turn it on it cost me a (garbled).
CHALLENGER Okay, I'll turn it on.
CHALLENGER Turn it on. You got the switch.
AMERICA Okay.

APOLLO 17 MISSION COMMENTARY 12/14/72 19:30 CST 190:37 GET 768/2

CAPCOM America and Challenger, both vehicles
may get a program alarm on the computers due to the W-matrix
overflowing. A VERB 93 will fix it in both cases.

AMERICA Oh, okay. Should we do a VERB 93 right
now for the heck of it any how?

CAPCOM That's affirmative. VERB 93 on both
spacecraft.

AMERICA Okay. I got my -

AMERICA Okay, Houston. I'm on the steerable
and I'll start tweeking to the best signal strength I can get.

CAPCOM Okay, Jack.

CHALLENGER (garbled)

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/14/72 GET 194:46 CST 19:39 MC 769/1

CAPCOM Jack, we think you've got the steerable up as good as it's going to get.

SC I think you're right. Okay, and I verify I am in slew and not in Auto.

CAPCOM Okay, thank you.

SC Yeah, are you going to leave us? Oh, okay, I got it. Okay. Okay, I (garbled). Man you guys got a lot of dirt up there. (Laughter.) It's clean now.

SC (garble) stowed.

CAPCOM Challenger, and America, about 2 minutes to LOS now on both spacecrafts are looking good.

SC Roger, Gordy, thank you. We'll see you coming around. Okay, Houston, this is America and we'll see you around there.

CAPCOM Okeydoke. Adios.

SC Hey, Jack, you want jettison bag? Not yet. Okay. Let me know when you want it. (garbled). Not yet. Okay.

PAO This is Apollo Control at 190 hours 51 minutes. We've had loss of signal now with America and Challenger docked together in the 52nd revolution and we'll be reacquiring in about 45 minutes. The current orbit for the two vehicles is 62.2 by 61.6, and they're currently at an altitude of about 62.2, very close to apogee at this time. This is Apollo Control Houston.

END OF TAPE

PAO This is Apollo Control at 191 hours 34 minutes, about 1 minute away from reacquiring America and Challenger on the 53rd revolution of the Moon. During this front-side pass one of the major activities here in the Control Center and also aboard the spacecraft will be to get the lunar module Challenger properly configured for the LM jettison and the subsequent de-orbit burn that will impact at -- into the lunar surface near the landing site at Taurus-Littrow. The Flight Dynamics Officer will be coming up with the numbers that will be programmed into the LM for that de-orbit jettison and subsequent de-orbit maneuver. Right now, we're looking a time for ignition, or rather, a time for separation of the LM of 193 hours 58 minutes, and a LM de-orbit burn at 195 hours 38 minutes 14 seconds. The LM will be jettisoned by severing pyrotechnic bolts that -- pyrotechnic charges that in turn sever the connection between the two vehicles. And we have AOS. We'll pick up the live conversation.

AMERICA (Laughter) I've been sleeping floating around in the tunnel.

CAPCOM America, Houston. We hear you talking.

AMERICA Hey, okay, Houston.

CHALLENGER Hello, Houston, Challenger's up also.

CAPCOM Okay, Challenger. Keeping busy up there?

CHALLENGER Yes sir, Gordo. I think we're moving right along with the transfer and stowage, and we'll give you a hack here. We got the ISA bag over for 82. We got the -- two of the sample return bags stowed and a decon bag, and they're over in a lot of miscellaneous stuff.

CAPCOM Okay.

CHALLENGER (Garble) probably, yeah.

SC Jack, is that --

SC What did that do, come lose sir?

SC Yeah, my whole book came lose.

SC You got something on there.

SC (Laughter) (garble) bag.

SC Thank you. I'm checking some of this stuff off.

SC Yeah?

SC That was a good one.

SC I didn't like (garble).

SC Okay, you going to put the Buddy/SLSS in the decon bag and stow it on Al?

SC That's in there now.

SC Okay.

SC Okay, ISA has got the -- yeah.

SC You just took the ISA bag -- the big --

SC Okay, but it had a lens brush, 16 millimeter mags, 3 of them?

SC No, we got a (garble) in there, Jack.
SC Okay, so I got those in.
SC Garble
SC Okay, those 16 millimeter bags are in R-13?
You have extra sample collection bags? You got two of those
in here? In there? In the ISA?
SC I need another -- yeah --
SC Okay.
SC I need another decontamination bag.
SC Got one that's got a metal plate in it
somewhere.
SC That's it right there. That's got a metal
plate.
SC Yeah, that goes in the BGA bag, I think.
SC Huh?
SC That goes in the BGA bag.
SC (Laughter) Oh, boy, I had a pretty nice
little home here by myself.
SC You got to go (garble).
SC I'm out of bags, I think.
SC How you doing down there?
SC Good to be back.
SC Yep.
SC (Garble)
SC Yep.
SC (Garble)
SC I'd --I don't even know what's going on in
the flight plan. Let's see.
SC This.
SC This, I think, isn't it?
SC Hey, what time is it. Let's see -- 191:40.
Ah, let me check.
SC One hour from now.
SC What?
SC One hour from now.
SC No, no, we haven't (garble).
SC One hour from now, it's suppose to be.
SC Okay, let me get some out.
SC We'll be working (garble) I guess.
SC Guess it doesn't make any difference which
one goes where, does it?
SC Jack, (garble) tangled up in the vacuum
cleaner cable.
CAPCOM America, Houston. We heard you talking
about the time there. As far as we can tell, you're right on
the time line.
SC Timeline (garble)

SC Right on the timeline, huh? Aren't we supposed to be closed out in about an hour?

CAPCOM Well, let's see --

SC That right? Or not?

CAPCOM Ron, it's about an hour and a half until you're supposed to close up the LM hatch.

SC Okay. An hour and a half yet. Yeah, we should get it by then, I hope.

SC Hey, Gene, do those SRC's have numbers on them, or weights, or anything like that?

SC (Garble).

SC Both weigh the same?

SC Yeah. Almost.

SC Okay, won't make any difference where I put them then.

SC (Garble)

END OF TAPE

SC Yes. Okay twitch.

SC Yes, that's alright. Well, it's serial number 1007 is in the B6 rock box area. I don't know how you tell which ones the number which numbers what.

SC Just a second I can't get the other one closed. No, I don't mean that one. I mean the B5 rock box.

SC Oops, I got the B6 back again. (laughter), yes I'll take it. Okay, there's a neat way to pass things back and forth. Okay, that's alright we'll keep - okay. Let me look - no.

SC You guys still got your PGA pockets on? Oh, okay. You didn't want any of the stuff that's in them? Oh (laughter).

SC You guys got some sample bags your putting A9?

SC You got a sample bag for me to put in A9?

SC No.

SC You don't.

SC Oh, wait a minute.

SC Okay. No, I just got an empty box.

SC Oh okay.

SC No, it just goes in an lithium hydroxide canister.

SC Okay.

SC You want the canister? It's easier to just put the bag in the thing over here, I think.

SC What's that? Okay, that's alright I'll get it. (Laughter) doesn't look like it's going to fit. Yes, it's number 7. Well, maybe it will fit. Oh, it fits. Sample bag number 7 is in A9.

END OF TAPE

CHALLENGER You know, from the looks of that dirt, no wonder it looks dark down there at that landing site.

CHALLENGER No, we're going to keep them all. We're taking them back.

AMERICA Okay.

CHALLENGER What do you mean. Unused ones.

AMERICA I don't know what this is all about.

CHALLENGER Okay.

CAPCOM We're getting a one way bit of communications here apparently with Ron Evans, whose mike is on voice operated, voice operated mode. Triggered by his own speech and Jack Schmitt and Gene Cernan in the Lunar Module apparently operating their microphones in the push to talk mode.

CHALLENGER Weight those yet?

AMERICA Yes.

CHALLENGER Okay.

CAPCOM And we hear Evans whenever he speaks to them, but we only hear the Lunar Module crew when they press the push to talk switch on their mike. Interesting to note that when Evans' mike is open, you can hear the vacuum cleaner operating in the background, presumably in the Lunar Module, where Cernan and Schmitt are facing the monumental job of cleaning up the LM cabin, the things that are being transferred into the Command Module, and the same job is going to have to be done in part in the Command Module, from all the dirt that will be tracked in from the LM and from the rock containers that are moved into the CSM for stowage.

AMERICA Oh, okay. Here.

CHALLENGER Hey, Ron, can you use that?

AMERICA We can probably always use that you know.

CHALLENGER Okay, I'll send it over to you.

AMERICA Yes.

AMERICA Hey, Houston. How was the quality of America's TV camera. That's the first time, chance we had to use it on this flight.

CAPCOM I don't think it could have been any better. We had a real nice picture.

AMERICA Hey, okay. Good.

AMERICA Never did find that one set that you were talking about.

AMERICA Send the tape over here. You want it? Yes.

CHALLENGER Here's your ...

AMERICA Okay.

AMERICA Okay, you can come up.

AMERICA No, we only have about 6 more sleeping pills left. Or 7 or something. I don't know.

AMERICA I don't like them. Sleep about one more probably.

CHALLENGER (garble)

END OF TAPE

SC (Laughter) You want in? Okay, just a second. Okay. Watch that bag. Oh, the big one. You'll have to have a bigger hole than this to get it through. (Laughter) Okay.

SC Okay, Houston, this is Challenger. I think we're getting close to being able to take your uplink.

CAPCOM Okay, Challenger. We're ready when you are.

SC Okay, you got (garbled) data.

CAPCOM Okay, and I also got the pads checked.

SC (Garbled) in R2. I don't think I'll ever find it in here. What does it look - is it a small book or what? Hey, Gordy, it looks like we got - we've got data card book stowed away and can you read each of the items and I'll copy down the pad that way.

SC Hey, wait a minute and I'll tell you (garbled) Jack.

CAPCOM Yeah, Jack, no problem. It's not that complicated anyway.

SC That's right, this is an easy one. Go ahead.

CAPCOM Okay. It's a LM deorbit pad and NOUN 33 or TIG is 195 38 1300. NOUN 81 X is a minus 002246. Y is a plus 00569. And Z is a plus 01677. The Apogee and perigee are - perigee is going to be minus. And Delta VR is 02860. Burn time will be 158, and the FDAI attitude for what it is worth here is 048 138 and 075. Go ahead.

SC Okay, here's the deorbit pad. TIG 195 38 1300; Delta V's are X minus 002246; Y is plus 00569; Z is plus 01677. Total Delta V is 02860, burn time 158; and FDAI angle is 048 138 075.

CAPCOM Okay, that's all correct.

SC Okay, Gordy.

CAPCOM You will need a LM weight for the DAP if you want to write that one down it's a 5185.

SC Okay, 5185 is the LM weight.

CAPCOM That's affirmative.

SC I never did get the purse back over here yet. It's in here. You don't need it. Okay. Okay. Yeah. I think that's all the stuff - think that's all the junk. Well, the - you know we have more than enough to eat everyday - the only food that's left is the - you know the food that's to come up. We got more yellow pills than we know what to do with. You do? Okay. Yeah. But that food that we didn't eat, it's gone. What did you do with it? In that big bag. (Laughter)

PAO The big yellow pills that Ron Evans was referring to are the germicidal pills that are mixed with the food after it has been - the astronauts have

PAO eaten what they want the remnant is mixed with the germicidal pill and stored. The pill prevents the bacteria build up and the subsequent build up of odors and so on in the spacecraft. The last series of numbers passed up to the crew included the time of ignition for the lunar module deorbit burn. And the parameters that will be fed into the LM guidance system to control that burn. The result of which will be to impact the lunar module into the lunar surface generating seismic waves.

SC That's your helmet over there, right?
Yeah. Okay, because I've only got 2 helmets here.

PAO The LM deorbit burn is now scheduled to be performed at ground elapsed time of 195 hours 38 minutes 13 seconds. This will be a 158 second burn, using the reaction control system thrusters on the lunar module and the burn will be controlled by the lunar module primary guidance and navigation system. With a total Delta V of 286 feet per second.

SC You want to make sure you got those

END OF TAPE

SC Okay.
PAO The deorbit burn will give us a predicted impact time of 195 hours 57 minutes 12 seconds. And the predicted latitude and longitude for impact is 19.95 degrees north 30.57 degrees east.
SC How about the monocular.
SC Yeah, I got it in my pocket.
SC Okay it's in your pocket.
SC You need that?
SC What is it?
SC Just a big bag.
SC No, I don't need it.
SC Okay.
SC (Garble) okay.
SC Okay.
SC If that's a good one, you just need one.
Okay.
SC Houston, America.
CAPCOM Go ahead, Ron.
SC Is a mag dog dog for LM jet on the 16 millimeter?
CAPCOM I'll check that. One other thing we'd like a H2 tank 1 fan on. Now to start getting it set up for the sleep period.
SC Okay. Just a second here. I'm stuck (laughter). Oh, Mr. Clean. You guys are so dirty. I'm going to make you sleep in the tunnel. Let's see H2 -
CAPCOM H2 tank 1.
SC Tank 1?
CAPCOM That's affirmative, tank 1 fan.
SC Okay, to on?
CAPCOM That's right on.
SC Okay, H2 tank 1 fan is on.
CAPCOM And we've got a vector for you if you want to give us accept.
SC Okay the old CMC making a big hatch right there in the middle of things. There it is. Okay, you've got accept?
CAPCOM Roger.
SC Hey you guys keep the bag up there. I'll get the rest of it.
SC We keep the bag.
SC Yes.
CAPCOM Ron, Houston. The answer to your question is yes mag delta delta is the one.
SC Delta Delta okay.
CAPCOM Shoot the whole thing, Ron.
SC Thank you. Get in there in a minute.
Let's see.

END OF TAPE

AMERICA Okay. Wait a minute. You're stuck on something. Okay. got it. Okay, I got it. You want the tape? The tape. Gene wants the tape.

CHALLENGER Yes. I'll need it.

CAPCOM Ron, Houston. If Delta delta is more than 50 per cent finished, then use Charlie Charlie.

AMERICA Okay. I don't think I've used Delta Delta, have I? I'll have to look at it and see.

CAPCOM Ron, one other thing to bug you, we'd like you'd to do the V48 load as shown in the flight plan. It'll claps a dead ban so we can check and make sure the LM steerable is right on the money.

AMERICA You want to do that now?

CAPCOM That is affirmative.

AMERICA Okay, why don't you read it to me, Gordo. And I'll get it, LAB DSKY down here.

CAPCOM Okay, it's a V48 R-1, you want 61101.

AMERICA Okay, Houston. This is America. I should have clasped it there.

CAPCOM Okay, Ron. That caught what we wanted.

AMERICA Okay.

AMERICA Yes. The jettison suited. Okay, Houston, mag Delta Delta looks like it's full. I was just going over the list of stuff here I got. And I think you've got everything.

AMERICA Okay, Houston, I guess we're GO or NO/GO for your LM closeout.

CAPCOM Okay, stand by 1 on that.

END OF TAPE

CHALLENGER Yeah, we're in jettison attitude now.
CAPCOM Challenger, you're GO for close-out.
CHALLENGER Okay, we're proceeding then.
AMERICA Yeah, I've noted -
CHALLENGER That's right. Leave that band at home.
AMERICA (garbled)
CHALLENGER (garbled)
CHALLENGER Hello, Houston, Challenger.
CAPCOM Go ahead, Challenger.
CHALLENGER Gordo, how soon is LOS?
CAPCOM Okay, LOS is 16 and one-half minutes.
CHALLENGER That's for LOS. Thank you.
CAPCOM America, Houston, I have a couple up-
dates to go in the flight plan.
AMERICA Ah, yep.
CHALLENGER (garbled)
AMERICA Oh, okay.
AMERICA Houston, I'm ready for the flight plan
update.
CAPCOM Okay, what it is is the CSM and LM
weights for the dap at 192 10.
AMERICA Okay, go.
CAPCOM The CSM weight with 3 men, assuming
you're going to have 3 men from here on out, is 36 545.
And the LM weight is 5185. And you might jot down a couple
trims for 3 men aboard. Pitch trim will be plus 0.60 and
yaw plus 0.81.
AMERICA Okay, CSM weight is 36545, LM weight
is 5185, pitch is plus 0.60, yaw is plus .81.
CAPCOM Okay, that's a good readback. The LM
jettison numbers are nominal as shown down the LM jettison
time for TIG and attitudes.
AMERICA Okay, wait a minute.
CAPCOM I realize there is no -
AMERICA 19403 30.
CAPCOM Okay, that's right for CSM SEP and the
LM jettison time is on a page before the 193 58 30.
AMERICA Okay.
CHALLENGER Okay, Houston, Challenger is going off
the air.
CAPCOM Okay, Challenger. It's been a pleasure
talking to you the last few days.
CHALLENGER It seems like an unfitting finish to a
super bird, but it's got one more job to do.
CAPCOM Roger, that.
CHALLENGER Take care, and Gordy, thank you.
CAPCOM Sounds like you're planning to stay
there.

APOLLO 17 MISSION COMMENTARY 12/14/72 21:23 CST 192:29 GET 776/2

CHALLENGER (laughter) I speak for the Challenger.

CAPCOM Say, one final thing. In - some time in the next 30 minutes Parker will be coming on to take over here and just for your information today is his birthday.

CHALLENGER Okay, thank you much.

PAO Parker is Astronaut Robert Parker, who is the spacecraft communicator, as Capcom, will be coming on to relieve Astronaut Gordon Fullerton on the shifts change in about 15 or 20 minutes.

END OF TAPE

PAO After that last transmission, Gene Cernan indicated that he and Jack Schmitt were ready to return to the Command Module, close the hatch and leave Challenger to be jet-tisoned and later deorbited into the lunar surface. And again to go over the information for the Lunar Module deorbit, the time of ignition, which will start the LM on its trajectory toward the lunar surface is 195 hours 38 minutes 13 seconds. The deorbit burn will be a 158 second burn, using the reaction control system thruster, providing a change in velocity of 286 feet per second, primarily slowing the LM down, and getting it in orbit that intersects the lunar surface. LM impact is scheduled to occur, will be targeted to occur at 195 hours 57 minutes 12 seconds and the target at impact point will be 19.95 degrees north, 30.57 degrees east, which is about 9 kilometers from the ALSEP in South Massif, and hopefully will be visible to the television camera on the lunar surface.

CHALLENGER You want a hose. Yes.

CHALLENGER What, the suit hose?

CHALLENGER Well, I was thinking of, no, (garble), that's Jack's.

AMERICA Okay.

CHALLENGER Okay, let me put the ...

CHALLENGER Hey, man, I'm going to put this thing on you.

CAPCOM Okay, America. You're about 2 minutes from LOS and everything's looking fine right now.

AMERICA Okay, it looks like the majority of the stuff is completed, so we should see you ready to go on the other side.

CAPCOM Oky doke.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/14/72 CST 21:40 GET 192:48 MC778/1

PAO This is Apollo Control at 192 hours
49 minutes. We're now less than 1 minute from losing radio
contact with Apollo 17. We'll be reacquiring in about
45 minutes on the 54th revolution of the Moon. And, on that
revolution, the lunar module, Challenger, will be separated
and jettisoned from the CSM, preparatory to it being
de-orbited and impacted into the lunar surface. We're hav-
ing a shift handover here in Mission Control. Flight
Director, Pete Frank and his team of flight controllers
coming on to relieve the team headed by Flight Director
Gene Kranz. And, we're planning a change-of-shift press
briefing for 10 P.M. in the MSC News Center Briefing Room.
At 192 hours 50 minutes, this is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control at 193 hours 31 minutes. We're slightly under 1 minute away from acquisition of spacecraft America on it's 54th lunar revolution. Still docked to the lunar module Challenger. Challenger will be jettisoned during this front side pass. We'll stand by now for first call to the crew.

SC Did I tell you direct O2 is OFF? The other day mine went up to 45. Well, it just goes that high. Don't make any difference what you do. I am too. So am I right now. No right yet, we got to wait till the O2 flow stops. Yeah, it'll increase out to, should be 41 to 4.5. Well, she's still going up. I'm reading 4.2 on the cuff gage. 41. And we're going up to about (garbled). Well, there's the total suits. Yeah, it's got 85 - 89. And it's stabled off about 43, 44 on mine now. Houston, America, how do you read?

CAPCOM Loud and clear, America.

SC Okay, we're in the(garbled) old suit circuit integrity check at the present time.

CAPCOM Roger, we're copying you live.

SC Okay, direct O2 is coming down now. Okay, O2 flow's coming down. And Houston, the tunnel's closed out and we're still in tunnel vent, and the hatch integrity is go.

CAPCOM Okay, we copy that.

SC And O2 flow's down to .5 now. Yeah, that's right. The suit integrity check will pump you up that high. It's a - regulates through the Delta over cabin. Yeah. Maybe she might make it down to .4. It's going down. Well, maybe she's got her sensors stored up tight. What do you mean, there's so much dust in the joint they couldn't be anything else but tight. (Laughter). They're tighter than they were when we started. Oh yeah? But that lubing is just so it collects dust to make them tight. Uh huh.

SC It was down to .4 now it's up to about .5. .4 1/2. All we need is less than .8.

SC Well, I hadn't been timing it. I guess it's about 30 seconds though.

SC Oh, yeah. All set.

SC Yeah, I'm happy. Let's go to depress.

SC Me too.

SC Don't go to OFF, Gene.

SC Okay. There we go to depress.

CAPCOM And America, Houston's also happy with all the suit outcome.

SC Yeah, it looks like you've been staying around -

SC Okay? Speaking of happy, happy birthday.

CAPCOM Thank you, Ron.

CAPCOM Sounds like you guys planned far ahead.
 SC (Laughter) Ron, we'll - we'll drop
 Challenger right on the South Massif for you - for your
 birthday present.
 CAPCOM Thank you Gene.
 SC Okay, LM power's off.
 SC Are you going to let the suit down or
 what?
 SC It's going down - it's going down slow
 though.
 SC Yeah, it is. We'll take it down real
 fast if you want to, but that's kind of hard on my ears. Okay,
 SECS power armed, circuit breaker, I wonder if I can reach
 those.
 SC Yep. There's BAT A and BAT B are in.
 SC And Houston, America, I guess we're
 ready for logic arm if you are.
 CAPCOM Roger. We're ready to watch.
 SC SECS logic. Okay. Here goes logic 1. Mark it.
 And logic 2. Mark it.
 CAPCOM Okay, America your GO for Pyro arm.
 SC Okay. We'll wait a while to do that.
 We're actually a little ahead of time.
 CAPCOM Okay, and America can you report a
 LM/CM Delta P?
 SC Hey, Houston, how does Challenger
 look to you?
 CAPCOM Okay, Challenger looks good, but we'd like
 the LM/CM Delta P.
 SC That's affirm, I -
 SC I'm seeing Delta P is off scale high,
 and I'm on about the 6th minute of my 10 minute tunnel
 vent, following 3.5 Delta P.
 CAPCOM Okay, copy that.
 SC Yeah, it does, doesn't it. (Laughter)
 That's right.
 SC You still (garbled) -
 SC Oh, you open the old suit circuit relief.
 We're tough though, us guys that go to the lunar surface. Yeah
 SC Yeah. You guys gotta be tough.
 SC We got a tough position here (garbled)
 if you want to try it.
 SC Just go to off.
 SC Bet your life you do.
 SC Okay.
 SC I imagine they had you humping.
 SC Yeah, a little bit.
 SC Now we're back to screw up your
 routine.
 SC Yeah, that's right. Don't let us
 bother you Ron. You just go about and do whatever you
 want to do. We'll just get clean for the next 3 days.
 SC Okay. Oh, we're down to 7 now. Lower limit.

SC I can't even see my EMS with that sunshine
in there.

SC That'd be a great (garbled) Ron's
ears are apparently bothering him. It's the only thing
I can decide.

SC Oh, we'll (garbled) that one, won't we.

SC Couple more times we'll be there.

SC Ten more times.

SC Okay. Tunnel lights are off.

END OF TAPE

SC We didn't hurt this end of the LM much.
SC Ah, it looks real good. I got some pictures of the bottom of it too, I think. When you guys were going around there. That looks real nice.
SC You always were bottom man.
SC Okay, suit circuits integrity checked. We have already done that.
SC Okay, I'm loading the EMS to plus 100 and making a no bias check right now.
PAO As a precautionary measure the crew will wear pressure suits while the lunar module is being jettied.
SC Okay, Houston. I've been in tunnel vent now for about 11 minutes after 3.5 on the Delta P and I'm going tunnel vent valve to OFF.
CAPCOM Okay, we copy that, Gene.
SC Houston, the low bias check got plus 100.9 starting out at 100 in a minute and 40 seconds.
CAPCOM Okay, we copy.
SC You'll have to stay inside.
SC Okay, one of the LGC you see - I just did that a while ago. Want me to do it again?
SC In the LM it is a (garbled)
SC Okay, right down here now. I can't see that very well. Do you want to read the checklist?
SC Okay, uncase the B mags. Right to low. Then bend in, okay, wait a minute. We will do that. Already at 45, let's see. Okay. Might as well, I guess. Okay. The SCS. Man, I don't use that anyhow really. I just - I really don't use that anyhow really. (garbled). Did you ask if full power is on?
SC True.
SC I don't either. You're looking right into the Sun. We're looking right into the sun so we won't be able to see it. Okay.
SC Yeah, I guess this one is done over here, but - if - it might still have something.
SC 12 frames a second.
SC Direct (garbled)
SC Yeah, I'll wait a while on that one though.
SC (garble)
SC 6 F Delta OFF now, okay.
SC Okay.
SC Will do. Both FM station and the - yeah, will change it. O2, okay. That's good. BB roll.
SC Yeah.
SC Okay.

SC Everything will be P30 before we get out of there.

SC Turn the page over there and - until you can see what the - see what we'll do. The jettison burn and then we'll burp 49 to a new attitude so we don't zap the hot exhaust into the assembly. And then we'll do a P-41 for separation. That new attitude. That's all over there. So, we'll do all that as soon as we separate then we'll go into the pre-separation or as soon as we jettison we'll go right to the precept checklist. At 10 minutes to - to sep - I mean jett. 10 minutes to jettison. Oh, that's all right - it won't work anyhow - see so - -

END OF TAPE

SC Okay, plus 110.00 (garble) plus 7.000, huh?
Plus 349. Okay, that's the NOUN 22's for the VERB 49.
SC Yep. Got arm controllers in, that's
all.
SC We'll use this for time, jet affect 55.
SC Those two, not the ones next to it.
Yeah.
SC Okay, pyros are coming on. There's A
and B. And, all breakers are in.
CAPCOM Okay, America, we see the pyros on.
Looks good.
SC Okay?
SC Get the -- where's that one? Okay?
SC Let me try it.
PAO Two minutes to jettison.
SC Yap, must be.
SC 193 hours. I don't know what
day this is, really.
SC Okay, must be 47 now. (garble)
SC Yeah, that's your Challenger. You can
do it. I brought him up here, though. He was
a good Challenger.
SC AGS on.
SC Is it running?
SC Yeah, it's running.
SC Okay, 55. 55, 56, 57, 58, 59. My Go--
there she goes. Yep. Well, yeah, it's holding out. Hey,
it's fired. Hey, there goes all the docking latches.
PAO Jettison on time.
SC There. Beautiful. Hope this thing's
working.

END OF TAPE

AMERICA You know, Houston, this is America, I guess in the terms of some of the gnomon people down in Florida, the LM is a wop-off.

CAPCOM Okay, we copy that.

AMERICA And Houston, I think the last few days have proved that they really did save the best till last.

CHALLENGER This - this - We need to get the maneuver now, Gene.

CHALLENGER Okay. Now try again.

CHALLENGER Okay, go ahead.

CHALLENGER Good, ready, PMC, rate 2, (garble) proceed.

AMERICA Boy, it's just stable as a rock out there.

AMERICA That's a stand by? Let me get some more pictures of them here.

AMERICA I think you might take. I'm going to change the setting down to about a 2.8, get to the bottom part of it there for a little bit.

AMERICA Right, well it's not quite at the bottom. It's right on the side, but.

AMERICA Okay, 16 up Main A Main B.

AMERICA Yeah, we'll be needing them.

AMERICA Okay, safe the pyros? Logic 2 is off, Logic 1 is off. Pyro arm battery A, Bat B, Bat A are open.

CAPCOM Okay, we copy them safe, America.

AMERICA Okay, Houston.

CAPCOM And you cabin looks good. LM also looks good.

AMERICA Hey, great.

AMERICA Okay, Houston, the preseparation checklist is complete, except for completing the maneuver and going to P41.

CAPCOM Copy that.

AMERICA And the LM is holding attitude very well.

AMERICA And we're going to get there at 194:3. 30. Okay, so TIC will be - well, let's see - 41 - we can start - we can - -

AMERICA Got so excited watching the LM that forgot to get going.

CAPCOM Hope you guys remember to take roll call before you let it go.

AMERICA (laughter) Say again, sir?

CAPCOM And America, we'd like high gain to AUTO please.

PAO That remark was by Deke Slaton.

AMERICA Yep. Okay, there's out (garble)

AMERICA Okay, Houston. How do you read on the Alfa?

CAPCOM Yeah, we read you on the Alfa.

AMERICA (garbled) controller's on. Let's see what about this time 140 (garbled)

AMERICA Yeah, you called Alfa did you not?
CAPCOM Yeah, we want high gain to AUTO guys. Let's
see if we can do it right now -
AMERICA That doesn't make any difference in the end.
We're burning now.
AMERICA Ah, well. Come on. (laughter) (garbled)
AMERICA Okay, there we go. - .1 to plus - well
keep the change, you can read it. Press on.
CAPCOM 17, we're not reading the 985. Would you
read them to us?
AMERICA Okay, 985, were minus .1 to plus .1 and
plus .2.
CAPCOM Okay, copy.
AMERICA Okay, Bob. You want me to get the high gain
back?
CAPCOM Stand by.
AMERICA Okay, (garbled) are off. We're going to
SIM bay configuration.
CAPCOM Okay, Jack, OMNI Alpha is just fine right
now. You've gone past the scan limits anyway.
AMERICA Okay. Okay we got SIM bay set configuration.
Okay. Give them a mark though, Jack, from when I extend the
antenna.
AMERICA Right.
CAPCOM Okay, 17. We're ready for you to start that
P20 maneuver, please.
AMERICA Okay, Bob. We're getting in there. (garbled)
52.
CAPCOM Okay, 17, we'd like to cold the extension
on the HF antenna until we get the high gain reacquired, we'd
like you to go to P20 at the time, we see that.
AMERICA Okay. Will do. Yeah, if we can get there.
Yeah, it's supposed to be the slow rate.
AMERICA Now we're going to (garble)
CAPCOM And Jack, sometime at your convenience, I've
got an update for the flightplan, it's pretty much your next
rev, so sometime during this rev, give me a call, and I'll read
it up to you. It'll start just about the time the next rev
starts.
AMERICA Okay, we'll give you a call on that, Houston.
CAPCOM Okay, Ron.

END OF TAPE

AMERICA Houston, America, magazine Dog Dog is
40 percent remaining.
CAPCOM I copy that. Okay, and America, we've got
a pitch of minus 67 and a yaw of 300 for the high gain.
AMERICA Okay, Bob, let me have the old flight
plan changes.
CAPCOM Okay. At page 195, excuse me - time
195:15 on page 304.
AMERICA Go ahead.
CAPCOM Okay. It says set high gain manual wide and
the new angle will be pitch at minus 5 and yaw of 315. And
the time will be 196:30 instead of 21:30.
AMERICA Go ahead.
CAPCOM Okay. You might also at that point write
in verify all command module VHF OFF. I am sure Ron will
understand what that means. He's been doing it all along
anyway.
AMERICA Yep.
CAPCOM Okay, then over at 195:31 -
AMERICA That just means you want the VHF OFF,
doesn't it?
CAPCOM Right. All of these, I think - three
switches over there along the side. And beacon ranging and -
AMERICA I think I understand that.
CAPCOM Okay, I thought even an LMP would under-
stand that. At 195:31 we're going to move lunar sounder
operate to OPERATE. The new start time there will be 195:3138.
Over.
AMERICA Okay. Lunar sounder operate will be done,
new time will be 195:3138.
CAPCOM Okay, and at the next page at 196:20 which
was the original lunar sounder stop time, we will move all that
block which starts with lunar sounder operate standby and
achieve stop - that will all move over and goes down to UV
ON. That block will move over to the 196:30 time of the next
column and the T stop time there will be 196:30.
AMERICA Okay, I'm going to move the lunar sounder
operate UV ON block from its present position to 196:30:00.
CAPCOM Okay, roger. And the the VERB 22 NOUN 79
that was originally starting at 196:30 will be done the follow-
ing that block of lunar sounder SIM-bay stops. And, Jack,
there -
AMERICA Okay, Bob, is there anything else?
CAPCOM Okay, in the middle of that section that
we moved, it says acquire STDN, says high gain angles, and
those will again be changed to minus 5 and 315 which is the
same change we made on the earlier page.
AMERICA Okay.
CAPCOM Okay, and that's extent of the update.
AMERICA Okay, thank you.
CAPCOM And America, we're GO to extend the HF
antenna.
AMERICA Alright, stand by about 30 seconds.

END OF TAPE

CERNAN Okay, Houston, HF antennas - going to
extend number 1, mark it.
CAPCOM Mark.
CERNAN Houston, was that marked for OFF.
CAPCOM Negative, that was a mark that we
copied you (garble).
SCHMITT Going to have to square a new guy away
here.
CERNAN Okay, I'm sorry, I'll tell - I'm going
to turn it off - go into extend again - mark it.
CAPCOM Okay, Marked that again.
CERNAN Bob, it was off for about 5 seconds
while I asked you that question.
CAPCOM Okay, America, we copy HF 1 extended
you go for switch off there and we're ready to extend HF 2.
CERNAN Okay, Bob, and that's grey now. And
HF antenna 2, mark it.
CAPCOM America, Houston, we're observing
C & C and 3 instead of going through the P 20. We wonder
if you accidentally could have switched.
CERNAN Okay, Bob, I think we've got it now,
thank you.
CAPCOM Copy.
PAO America's crewmen are removing their
pressure suits now. We show America's present orbit
is 63 point 8 by 61 point 1 nautical miles.
CERNAN How's that antenna looking..
CAPCOM Okay, yeah, we're just going to tell
you it's probably not quite out yet according to indicators
that I guess you see. I would like to go off, though, to
keep the motor from heating up. We'll come back on it a
little bit later.
CERNAN Okay, it's off and the talkback window
at grey with it going off.
CAPCOM Roger (garble).
CERNAN That's affirm, Bob.
CERNAN Houston, America -

END OF TAPE

SC Houston, America.
SC Houston, America.
CAPCOM Go ahead, America.
SC Okay, Robert, I just want to tune you in on our mode of operation here for the next few hours. A - we're getting Ron out of his suit so that he can operate more effectively and efficiently the SIMBAY. And, then Jack and I are going to start getting out of our suits and trying to clean up a little bit and that's going to probably be a long and a tedious operation but we're just going to have to take that time.
CAPCOM Okay, we copy that. And, Ron, HF2 is the one that we're not quite sure of and you might take a visual on that - I think you've looked at it before when it's fully extended and and give us a clue whether it's 99 percent extended or not. Go ahead, Gene, I think I cut you off.
SC Stand by one - Wait until sunrise
Bob, and he can look at it.
SC Bob, you're probably going to have to wait until sunrise to get a good verification of that.
CAPCOM Rog. Copy that. I just looked down the flight plan and saw you going into darkness.
SC It's easier with us.
SC And, Bob, during this LMP and CDR suit doffing and CWEG change out and so forth the LMP will be off bio-med until he gets a new set and gets cleaned up and get them on. So I just want you to understand all that.
CAPCOM Okay, yeah. We understand.
SC Okay.
SC Bob, what's the LM impact time.
CAPCOM Okay, standby on that. - Okay, 195 57 20.
So it's 57 20.
SC Okay, then that's about an hour and 20, right?
CAPCOM That's right.
SC Okay. Of course, we're just interested in the whereabouts of the Challenger, so when the time comes up give us a holler, will you?
CAPCOM Oh, Roger, we will do.
SC We're still very much interested in her performance.
PAO That impact time is an update from the previous impact time of 195 57 12. Present impact time 195 57 20.

END OF TAPE

CAPCOM Okay, America, Ron, we'd like you to go on HF2 there. We've got apparently most of the way out but apparently is stuck a little bit. We'd like to get the HF2 to retract for 10 seconds and then go to extend for 20 seconds. Over. And we'll be watching here on the ground.

AMERICA Okay, that's HF2 and we'll go to retract and let's see - I need three hands here - VOX, let me get VOX. Okay. HF2 going to retract 5, 4, 3, 2, 1, mark it. Okay, we'll stay that way for 10 seconds - we've got a barber pole - and mark it, okay? And, it's off now. Now you want to go to extend for 20 seconds.

CAPCOM That's affirmed.

AMERICA Okay, 5, 4, 3, 2, 1, mark it. Got a barber pole. Okay, 21 seconds and it was off. Hey, somebody just told me about looking at HF2. That's the one I can't see.

CAPCOM Okay, we copy that, too, Ron. Thank you.

AMERICA Yeah.

CAPCOM Okay, Ron, we'd like you to do that same cycle one more time. Retract for 10 seconds then extend for 20 seconds again.

AMERICA Okay. And HF number 2, 3, 2, 1, mark it, retract. Okay, 9, 10, it's off. Okay, 3, 2, 1, mark it, it's extend. Yeah, it was stuck right in there. Oop, okay, that's 23 - 23 seconds before it went off.

CAPCOM Copy that one. Okay, we think it's starting to clear up, Ron. If you'll put it in extend and leave it there, we'll give you a call, or until it goes away.

AMERICA Okay. 3, 2, 1, mark it. It's going to extend.

END OF TAPE

CAPCOM Okay, off please, Ron.
EVANS Okay, off and it was off for a minute
and 8 seconds.
CAPCOM Okay, and the other was still barber pole,
right.
EVANS It was still barber pole, yeah.
CAPCOM Okay, America, your goal for LOS and
we'll be picking up on the HF path as per the check list.
Ron, we'd like to have you look on the back side - see
which or any antennas you can see out there, just to give
us a status when you come around the horn. Over.
EVANS Okay, we'll give 'er a try.
CAPCOM Okay, thank you.
EVANS I can see the one out window 1, window 1
is the only one I can see.
CAPCOM Copy that.
EVANS And that happens to be HF number 1.
Evans Oh, here's a little - the electrical
covers - oh, there're - each one of them is in your bag
here. Yeah.

PAO This is Apollo Control at 194 hours 47
minutes. We've had loss of signal from America. When we
next acquire on the 55th revolution we'll be about 6 minutes
away from the LM deorbit burn. Ignition time for that
maneuver 195 hours 38 minutes 13 seconds. Burn time 158
seconds, velocity change 286 feet per second. The impact
time was updated during this revolution, now expect impact
at 195 hours 57 minutes 20 seconds. The impact coordinates
have not changed, 19 point 95 degrees north, 30 point 57
degrees east. This is on the South Massif. At 195 hours 49
minutes, this is Mission Control Houston.

END OF TAPE

PAO This is Apollo Control at 195 hours 30 minutes. We are 54 seconds away from acquisition on the 55th revolution and 7 and 1/2 minutes away from the de-orbit maneuver. We'll stand by for first communications on this pass. America's orbit now 65.3 by 62 nautical miles.

SC Okay. And, here we are (garbled) Charley.

CAPCOM Roger. America, Houston. We read you loud and clear.

SC Okay. Houston this is America. For your planning purposes there, we got a little tied up and started the receive only tape recorder at 195:24.

CAPCOM Okay, I copy that Ron.

SC Okay, Houston. HF number 1 is sticking out where it should stick.

CAPCOM Okay, we copy that and - stand by. Okay, go standby on the lunar sounder, please, Ron. Somebody is word down here. Standby on the lunar sounder.

SC Okay, (garbled) Okay, standby.

CAPCOM Okay, Ron. We're going to do this one in VHF, apparently they're still too worried about your HF antennas - so if you'll take your mode switch to HF when we get ready to go - come out of standby we'll do it in the VHF mode.

SC Okay. We're - we'll standby on your call then. I'll go to VHF now if you want. Or would you rather have HF receive - I'll standby on your call to go to VHF.

CAPCOM That's affirmed, Ron. You can go to VHF now and standby on our call to come from standby to on.

SC Okay, modes in VHF.

SC Houston, America. What - is somebody kind of afraid that maybe the antenna isn't all the way out? Is that what the problem is?

CAPCOM That's affirmed. They're worried about HF 2 not being being all the way out and they think that they won't get much - if it's partially extended so we'll see what we can get with VHF instead. And right now we're going to standby to warm up the film to set it to go.

SC Okay.

SC I don't think I ever told you down there that mag keyhole keyhole was on frame 99 at the end of the rendezvous. At the end of the picture taking sessions there.

CAPCOM Okay, copy that.

CAPCOM Okay, and America, we'd like to bring up the high gains - what they use in the VHF and we'd like pitch of plus 25 yaw of 200 NARROW and REACQ.

SC Pitch of plus 25 yaw 200 REACQ and NARROW.

SC Pitch of plus 25. - Okay. - Okay.

PAO 15 seconds to ignition.

SC Okay. Mod sensor.

PAO The LM is burning now.

CAPCOM Ron, we'd like H2 tanks 2 and 3 fans to on.

SC Okay. - 2 - H2 tank 2 is on, tank 3 is on.

PAO The burn has been completed.

APOLLO 17 MISSION COMMENTARY 12/15/72 00:23CST 195:30GET MC 788/2

SC That end might stick. It might stick there.
The back won't stick to anything. It's the wrong kind of stuff. If
that won't, this will.

SC That's the vacuum transfer to the ECS.
I can put those away.

END OF TAPE

CAPCOM We're nine and one half minutes away from predicted impact. Okay, America, stand by 5 minutes to Challenger impact. Mark

EVANS Roger, 5 minutes to Challenger impact, huh.

CAPCOM That's affirm. I don't know if you guys can see it out 1 window or not -

SCHMITT We're doing all right.

EVANS Let's see, we should be what - behind it, aren't we?

CAPCOM Say again, Ron.

EVANS Shouldn't we be behind him.

CAPCOM I should think he'd be a little bit behind you, right? Ron, I'll take that back, I think he is in front of you.

EVANS That's kind of the way I thought it would be. But unfortunately, we're looking behind us.

CAPCOM And 3 minutes to impact.

EVANS Okay, 3 minutes to impact.

CAPCOM Mark, 1 minute to impact.

EVANS Okay, 1 minute. Yeah, we're right over (garble) now.

CAPCOM 10 seconds.

CAPCOM We've had LOS on the LM. Okay, we've had LOS on the LM and we don't believe we saw it down here, fellows.

EVANS What do you mean you don't believe you saw it.

CAPCOM That means that we didn't see it - on the TV.

EVANS Oh, on the TV, I see, I see.

CAPCOM We are picking up the signal on the siesmograph, though, the geophones.

EVANS Okay. Hey, Houston, I can see a bright spot on the South Massif, on the top of the South Massif.

CAPCOM Okay, go ahead again there, guys.

EVANS Okay, this is America, I can see a bright spot on the top of the South Massif and - let me see - from the west you got the first hill or the first part of the mountains, then there's the valley and then there's a valley that kind of goes into a Y - a Y looking valley. I guess if you come from the east it's the second ridge from the east and right on top of that ridge is a bright spot. I don't know how big, I don't know how big a crater it should make.

CAPCOM Okay, we copy that and we'll take a look at the maps and see what we can find.

EVANS And I'll put a spot on my map if I can do it here. Just a second.

CAPCOM And, Ron, this is Houston, you ready to copy an update in the flight plan, please for me.

APOLLO 17 MISSION COMMENTARY 12/15/72 CST 00:36 GET 195:43 MC 789/2

EVANS Okay, do you need it right now or could
I mark this on the map first.

CAPCOM No, oh no, go ahead and mark the map
first.

PAO The seismic recorder data on the monitor
is coming from the Apollo 17 Lunar Seismic Profiling
Experiment. The preliminary estimate is that the LM impact
was within 15 kilometers of the Apollo 17 ALSEP site.
And the TV camera will be coming off shortly.

END OF TAPE

AMERICA Hey, Houston, America.
CAPCOM Go ahead, America, this is Houston.
AMERICA Okay, Bob, I don't have a map with South Massif on it, you know with the radial interval on the thing and it looks like the only thing I can use in the visual observations book would be landing site 204, and if you draw a line - do you have that one?
CAPCOM Okay, I'm alining site 204 in front of me.
AMERICA Okay, if you draw a line from Shorty to that resolve mark that's on the top of the massif -
CAPCOM Copy that.
AMERICA And then extend about a little better than an eighth of an inch toward Shorty to that resolve mark. Have you - yeah, somewhere right in there. I'll look at it again the next time I come over. But, that's a bright spot on the top of the massif that I hadn't noticed before in any of the observations going by there.
CAPCOM Okay, I've got it marked down. We'll also see if we can find it on the bigger map.
AMERICA Okay. You know that bright spot might already be there, but I don't think so, I don't remember seeing it.
CAPCOM Okay, copy that. Okay, and Ron, we'd like to press on with our flight plan update for you.
AMERICA Okay.
CAPCOM Okay. Number one, we'd like to go HF2 to extend for 3 minutes.
AMERICA When? Now?
CAPCOM Roger, now.
AMERICA Okay, 5, 4 - okay, countdown - 3, 2, 1, mark it in extend. Barber pole still.
CAPCOM Ron, drop the antenna, please. My mistake.
AMERICA What?
CAPCOM Okay, Ron, let me read through this one for you. They are anxious to extend that but they want the data system on so they can see it first. Why don't you go to 9620 in the flight plan. You're probably sitting there looking at it, anyway. And run through that block, the spare starts at about 196:19. We told Jack to move but since we're aborting the lunar sounder path, let's go to 196:20 and carry out the steps in there with the following exceptions: Do not turn recorder or radar to OFF. Okay. We want lunar sounder left in standby.
AMERICA Okay. Let me read those through.
CAPCOM Okay, and don't move the high gain. The high gain has been taken care of already.
AMERICA Okay, I'll do that. Lunar sounder is verified. Stand by. Data system coming on. High gain is already working. (garble). Jack, could you turn on the service module AC? I'll get it. Yeah. Okay, service module AC power's off. Lunar going to standby.
CAPCOM Okay, and Ron -

AMERICA and we'll leave the recorder on and radar off.

CAPCOM And Ron, while you're putting those last three on, let's start the HF2 to extend. They'd like to get it before it gets too cold again.

AMERICA Okay, HF2 is going to extend - 4, 3, 2, mark it.

CAPCOM Okay, we'll time it for 3 minutes for you while you get the IR and so forth.

AMERICA Okay, IR is going on. Self test is on heaters. EV is on.

CAPCOM Okay, copy that. Okay, Ron, we see the clock backwards and got off.

AMERICA Hey, it did. Okay, it's off.

CAPCOM Okay, I guess we'll try and work that in some other time now that we've got the antennas out. And we'd like to high gain antenna to auto and 2-1/2 degree deadband now that were not doing the lunar sounder.

AMERICA Okay.

CAPCOM Okay, Ron, and did you get the high gain in the 2-1/2 degree deadband?

AMERICA Affirmative. Yeah, I got that.

CAPCOM Okay. You got that and I got a TI of 65 pad when you get ready for it.

AMERICA Okay, let me pull out the old book.

CAPCOM Okay, and Ron, if you'll give us the computer, we're ready to uplink some loads. for you. You'll be the jet out monitor and the (garbled) sensor.

AMERICA You can have the computer.

CAPCOM Okay, thank you.

AMERICA Okay, I'm ready to copy the TEI. Got it all dirty. Houston, America, I'm ready to copy the TEI pad.

CAPCOM Okay America, it's Houston. I'm ready to read the TEI pad if you're ready. It's an SPSSGN which is a surprise, I'm sure, and it says, 36541 plus 060 plus 081. 216454823 plus 27545 minus 01469 minus 00090. 179103359. The rest of the pad is NA. GDCR in stars are Sirius and Rigel. I guess they picked some bright ones for you for a change. We have alinements of 136 -

AMERICA There, that's a good one -

CAPCOM 160 and 034. Ullage is 4 jet 12 seconds and we're using liftoff retromat. Over.

AMERICA Okay, TEI - I've forgotten what the reference was.

CAPCOM 65.

AMERICA PSG and N 36541 - 55, okay?

CAPCOM 65, 65.

AMERICA Oh, 65 it is? Okay, now on 47 the weight - 36541 plus 060 plus 081216454823 plus 2754.5 minus 0146.9 minus 000.0179103359. Sirius and Rigel 136160034. Jet 12 seconds for ullage. Liftoff retro -

END OF TAPE

SC Sirius and Rigel, 136 160 034 dead 12 seconds for ullage and we used liftoff rest mat, which is what we have right now.

CAPCOM Okay, Ron, and you dropped out there at 2 momentary seconds. 1, the DELTA VZ was minus a 9.0 - ullage was 4 jets.

SC Okay, that's right. DELTA VZ is minus 9.0 and 4 jet ullage 12 seconds. Lift off REFSMMAT.

CAPCOM Okay, you had a momentary dropout when you read those two figures.

SC Okay.

CAPCOM And, America, Houston. Do you fellows think you have any chance, or would have any chance next time to take a picture of that possible impact point - with the hand held Hasselblad - or something?

SC Ah - sure can. You betcha. I think the best way to do it is with the 250 lens on the Hasselblad.

CAPCOM Okay. It might be something worth getting just in case we don't hit it with the pan camera later on.

SC Okay.

CAPCOM Okay, Ronald. The computer is yours and you can turn the lunar sounder radar switch off - leave the recorder switch on.

SC Okay. The recorder's staying on and we'll turn the - radar off.

CAPCOM Roger, radar off - recorder on and the computer is yours.

SC Okay, radar's going off and the recorder is still on. And - we LOS.

PAO This is Apollo Control at 196 hours 25 minutes. The tracking stations at Carnarvon, Honeysuckle, Hawaii and Goldstone recorded the Greenwich Mean Time at LM Loss of Signal as 6 hours 50 minutes 20 seconds.

SC Yes, (garbled) do it later on.

SC How about getting the recorder going there?

SC What?

SC How about turning the recorder on? - Huh?
It's right in here.

SC Yeah. It's time to eat.

SC I don't care. Okay, waste to purge line heaters.

SC You're on. Then vent.

CAPCOM America, Houston. Ron, over.

SC Roger, go ahead.

CAPCOM Okay, one, while I'm talking to you how about flipping up and turning H2 tank 3 fan off?

SC Okay, tank 3 is off.

CAPCOM Okay, and then, how about you 3 guys giving us - giving some consideration the next 2 or 3 minutes to the following proposal? One, we totally avoided that lunar sounder pass because: 1, we couldn't get the HF antenna out and 2, because the temperature in the dome cassette was too low. Those things are both taken care of now and they're talking down here about essentially starting over at 197 hours which will be the top of the next page and pretending that that's 195 hours and running through that 195 hour page, beginning at 197 hours. The only problem with that, of course, is it runs into your eat period and destroys that, which essentially means that you're going to get to bed an hour later and, I guess what we're saying is if you're going to get to bed an hour later anyway we might go ahead and ask you to do it if you're agreeable. If you're clean-up - cleaning up companions there and have progressed far enough that you think you're going to get to bed on time and don't want to do it then that's another story. So, how about chewing it over there and letting us know.

SC Okay, let me talk to the guys here for a minute, but I think we'll probably do it. Stand by.

SC Hey, Houston, America. Let's press on and pretend like I'm eating between when I'm turning the lunar sounder on and off - Okay? In other words, let's get the lunar sounder pass.

CAPCOM Okay, well you're saying, well - well, we don't want you to have to do that in the middle of your eat period and destroy that, Ron. That's another concern we had here.

SC Don't worry about that. I - I can throw those switches on and the other guys can fix the food and I can eat it at the same time. No problem.

CAPCOM Okay, we've got that recorded on tape there, Ron. Okay, what we're going to do is essentially -

SC Okay. (laughter)

CAPCOM - essentially start at the 195 hour page and we'll just mechanically add 2 hours to every thing on that page and run through it as - on the page. Okay? The change that we originally had in the flight plan which I read, I don't know whether it was to you or to - a - Jack, which moved the group from 196 20 over to 196 30 - will still move over to 196 30, so that will stay as is. And, again, that will be of course at 198 30 then. Do you understand what I'm saying there? Over.

SC Yeah, I think what you're saying is, we'll just do the flight plan like you - like we're starting at 195.

CAPCOM Roger.

SC Looks like we'll be 2 hours later on the Mason Timer.

CAPCOM Roger, you might call it mini-mock update.

SC Okay. Sounds good. Lunar sounder operating time will be 197 31 38 then, right?

APOLLO 17 MISSION COMMENTARY 12/15/72 01:15 CST 196:22 GET MC791/3

CAPCOM That's affirmative.

CAPCOM Okay, Ron, and 2 comments on that. Let me make a couple of other amendments to that. One, the lunar sounder operating time instead of being 31 38 will be 32 51. At that 195 - top of the right hand column on 195 there. 195 32 51 . Over.

SC And Houston, these waste water dumps fuel cell purges, that doesn't foul up sounder as I recall, does it?

END OF TAPE

SC And, Houston, these waste water dump fuel cell pressures that doesn't foul up the lunar sand as I recall, I don't think - does it?

CAPCOM Oh, we can go ahead and do those in parallel, right.

SC Okay, good. That's what I thought.

CAPCOM And Ron, one other - did you catch my one - my 3251 update there on that start time?

SC Did you say cancel it? I'm sorry.

CAPCOM No, do copy. I gave you 1953251 as the start time, instead of 3138, did you copy that?

SC Yeah, I copied, I'm sorry. Used to working in the box all time and I forget to push the button.

CAPCOM Okay, and the other thing we'd like to keep you aware of, if you hadn't noticed it, and that is that this thing of course, Ron's originally to a 19630 plus which means that you're going to be running 19830 plus which kind of looks like you're going to be eating at least a half an hour into your sleep period, at the very least. Over.

SC Yeah, we understand that.

CAPCOM Okay, Ron, we'd like to have H2 tank 2 fan OFF now please.

SC H2 tank 2 is going OFF.

PAO This is Apollo Control at 196 hours 46 minutes. We've had loss of signal from America. We'll acquire next in about 45 minutes, on the 56th revolution. In about 13 minutes another lunar sounder pass will begin to compensate for the one that was lost at 195 hours. Because of an antenna problem and low film cassette temperatures. Those problems have been corrected and the crew will do a new pass beginning at 197 hours. This will probably put them to bed about 30 minutes later than the flight plan time. Rest period will probably begin now. About 199 hours.

END OF TAPE

PAO This is Apollo Control at 197 hours 29 minutes. We are less than a minute away from acquisition of America on the 56th revolution. We'll standby for this pass.

CAPCOM Hello, America. This is Houston. One minute to lunar sounder operate - mark.

SC Okay, one minute to lunar sounder operate MARK. This is your friendly commander, clean and happier, back up.

CAPCOM Roger, Geno. We're glad to hear you're clean again.

SC Well, I'm not really clean but it's a major step in the right direction.

SC 30 seconds.

SC Okay, 30 seconds.

CAPCOM Okay, and mark on lunar sounder operate now.

SC Okay, Bob.

CAPCOM And, America, a question here. Did you get an ISS alarm on the backside just a few minutes ago?

SC No, sir.

CAPCOM Okay. We lucked out. We'd - since we'd had the jet monitor program operating and it hadn't been killed, which had originally been planned after lunar sounder, there was a possibility that we'd get an OR but we don't have it. Good enough.

SC What was going to cause that to come on?

CAPCOM The possibility, Ron, was when you were reloading NOUN 79, getting a smaller dead band - it depends upon where the vehicle was at that time within the old dead band. EMP 523 might have suddenly found you outside the dead band and been unhappy.

SC Ah, okay. I'm with you. Thank you.

CAPCOM Okay, looks like we lucked out some.

SC Say, Bob, do you know - do you know any more about the demise of Challenger?

CAPCOM We know that it was within 15 kilometers of where it was supposed to be, Gene. We could not get a visual on it. It was quite obvious that the geophone saw it and all that - there's no question about that, it's just that as it turned out at the last minute it was pretty hard to pick where exactly it was going to be in order to have the TV camera there.

SC But everything appeared to function properly on the ALSEP and - you're pretty happy with it?

CAPCOM Roger. Everything except the TV and of course that's just an extra goodie.

CAPCOM And, America, if you guys are interested in trying to take a couple of 250 millimeter shots of that time, we've got a little camera pad here 4B can pass up - if you're interested.

SC Hey, you bet I'll take - I'll try it.
CAPCOM Okay, let me know when you get a piece
of paper there, Ron.
SC Okay, go ahead.
CAPCOM Okay, it's LM TCA and it's time is
197 56 35 and the camera data is CM 5 EL 250 CEX F5.6 1/125
infinity and magazine Kappa Kappa or Kilo Kilo and you
can use up to 10 frames on it. Over.
SC Okay. I think I'll put Kappa Kappa back,
I've got Oscar Oscar on there. How about it if I use that, Okay?
CAPCOM Okay, that's fine, Ron. And, we'd like to
get H2 tanks 2 and 3 fans back on.
SC 2 and 3 are on.
CAPCOM Okay.
SC Hey, Bob. A quick summary on that ren-
dezvous as far as LM performance was concerned. Handling
characteristics were outstanding and pretty much the same as
they have always been on LM command. The APS burn went nominal
the residuals on that one were actually quite big, about 744,
that's feet per second - and we nulled those out and after that
the midcourses were back to 1.3 and then a max of 1.6 on the
second one. But, after the TPI we were coming up the pike
right - over - right - all the way in the line-of-sight range -
actually both out of plane as well as in plane were - zero -
practically zero for out of plane and as predicted on a nominal
curve for in-plane. And really, it was pretty much a story book ren-
dezvous.
CAPCOM Okay. Ron, do you want to give me that
TPI again or did you already pass that down to ground command
didn't copy the residuals then?
SC No, I didn't tell them that. We didn't
get a chance to copy them down cause I wanted to get this all
down on tape. It surprised me after the APS burn because they
were relatively large. They were 7 feet per second in X
4 in Y and 4 in Z. And that was, I guess, just short of a
4 second burn or around 4 seconds.
CAPCOM Okay, copy that.
SC And one other little thing we put
I think 2 marks - 3 marks - 2 or 3 marks in the AGS - manual marks,
after the last midcourse, as we'd been doing in the Simulator.
3 marks, and Jack tells me that the range rate came right up to -
right up to the actual radar range rate - right up to 100 feet or so.
CAPCOM Okay, copy that.

END OF TAPE

SC Bob, we're all just eating away here, anything interesting in the World news that's worth commenting on.

CAPCOM Okay, stand by, let me find out. Did you guys get any news this morning?

SC No sir, we were busy otherwise.

SC Yeah, I did.

CAPCOM Okay, well stand by and let me get hold of the people and see if we can get some news for you. Okay, Gene, we're working on that, it may take us a while to get it and but we ought to have it for you before the end of the pass. From my own experience talking around you although none of us hung around much to read that stuff today, we don't think anything much did happen in the world today. There is a report that something did happen in outer-space. The Moon vehicle, we believe, had a lift off this afternoon and a rendezvous, we're trying to see if we can track down any further news of that. Over.

SC Okay, we're pretty much up on that one. Just wondering, you know Mr. Truman has been pretty sick and so forth, wondered about some of those things, but no big deal, we can wait.

CAPCOM Okay, we'll get with you shortly. Hey, in the America, did you fellows do your hydrogen purge on the back side.

SC That's affirm. Had us a purge, an O2 purge, and - would you believe we forgot to turn the H2 purge line heater off, off now.

SC Thank you.

SC First saw the leak on there.

CAPCOM Old Decon was watching the currents there. He had you pinned down.

SC (laughter) Good.

CAPCOM Okay, and America, I presume you guys are sitting there looking at page 195, is that affirm, so I want bother to tell you all you all these other things that are going on on that page, presuming that you're not looking at page 197.

SC Yeah, we're on page 195, yeah.

CAPCOM Okay, good enough.

SC Really is the hour 195, you know.

CAPCOM OMNI Bravo, please, America.

SC Okay, You have it. Houston, this is America, there was frame 145 to 150 on magazine Oscar Oscar.

CAPCOM Okay, copy 145 to 150 on Oscar Oscar. and if you guys are starting to sort out film mags for the next day, which is for what, about 198 hours, it will be magazine Kilo Kilo instead of November November in that. It will be Kilo, Kebet and Romeo for tomorrow.

SC Okay, Kilo, Kebet and Romeo.

END OF TAPE

SC Houston, 17.

CAPCOM Go ahead.

SC A little historical note. Passing over the Hadley Apennines sites from Apollo 15, we notice that at their landing point, there's the same slightly or - distinctly brighter albedo area as there is at Taurus Littrow site.

CAPCOM You mean down on the plains of Taurus-Littrow right where the LM landed? Or you mean where you think the LM impact was?

SC That's affirmed that in spite of the - no, no, no, where the LM landed - in spite of the - as we walked along the surface, and this is true at Hadley also, you stirred up a darker zone, albedo-wise, but when you look at it from orbit, the area around where the LM landed is a distinct bright spot on the surface of a very uniform gray albedo plain. And both sites look just alike.

CAPCOM Okay, we copy that.

SC In that regard, anyway.

CAPCOM We copy that.

PAO That report was from Jack Schmitt.

CAPCOM And America, you might be interested to know that the way this Span status report still lists all the LM ECS parameters as normal.

SC Beautiful, Span's up to their old tricks again, I see.

CAPCOM I guess you depend on how you define normal.

SC Somebody must have spilled coffee on their console Listen, Bob, the way it was performing, I wouldn't doubt it.

END OF TAPE

CAPCOM America, this is Houston. Over.
SC Go ahead.
CAPCOM Okay, Okay. I'm keeping track of you guys here on the lunar sounder offtime. It'll be just slightly less than 19830 and I'll give you some pads on that when you get down to it. And we're ready to go to H2 tanks 1 and 2 to OFF, and tank 3 to AUTO.
SC Okay, Bob, that's got it. 1 and 2 OFF and 3 AUTO.
CAPCOM Okay, and you can delete the - when you get to your presleep checklist, you can then delete the cryo stirring.
SC Okay. And Bob, what time is AOS?
CAPCOM (garbled) you want AOS or LOS? LOS, stand by.
SC Yeah. LOS.
CAPCOM We have LOS at 1984537. About a little over 22 minutes from now.
SC Thank you, Bob.
CAPCOM Okay, 2 minutes to lunar sounder. Stand by.
SC Roger. 2 minutes to lunar sounder. Stand by.
CAPCOM Okay, 1 minute mark at 2843.
SC Rog, 2843.
CAPCOM 10 seconds. Mark and stand by.
SC It's stand by.

END OF TAPE

SC Okay, Houston, (garbled).
CAPCOM Okay, we copy. You're down as far UV ON.
Now we'd like to have IR cover OPEN, and UV cover OPEN also.

SC Okay. Stand by. Did you want 2 and 1/2 degree deadband for the night?

CAPCOM Rog. I was just going to say we can also go to VERB 22 for the 2 1/2 degree deadband. Okay, and America, another thing down here 19647 there are the 2 COMM call outs DSE in motion and setting the high gain to manual before LOS, and we want to catch those before you go around the back side. And just - yeah, as you around at LOS and after that we're then ready for you guys to skip to 198 and the pre-sleep - pre-sleep checklist.

SC Okay, we can do that.
CAPCOM Okay, and America, if you have time I have a few news items to read up to you here.

SC Go ahead, Bob.
CAPCOM Okay. Dateline Washington, the United States today threw it's support behind the Christmas peace package proposed by South Vietnamese President, Nguyen Van Thieu and accused North Viet Nam of using high pressure tactics in attempt to impose an incomplete peace settlement. American representative of the Paris peace talks, told the Communists it was futile for them to continue clamoring for signature of the cease-fire agreement drafted in October by Kissinger and Le Duc Tho. In Kansas City the condition of former President Harry S. Truman weakened to quote very serious Thursday. His doctor says vital signs are stable but Former President Truman was unable to speak his lungs were filling with fluids still, and his kidneys have been impaired. In Mexico City the international federation of airline pilots, meeting in Mexico City this week, has promised a world-wide stoppage of all transportation industries if the government does not take action to stop hyjackings. In New York, the United States won an apparent victory in the United Nations when the General Assembly voted an approval of a cut in U.S. contributions to the world organization. Vote was 81 to 27. And reduces the U.S. budget assessment from 31.5 percent to 25 percent starting 1974. Here at home in Houston, the city council voted to locate the new proposed sports arena in Greenway Plaza. The (garbled) however stipulates that the mayor find a way to finance it without using city tax funds. Council indicated that if the mayor can't do this, the city will abandon it's plans for the 10 million dollar 18 thousand seat facility. On the lighter side, in Jersey City, only 1 of 51 women who took physical exams for the police department passed. Police director Fredrick Stevens said 24 of the women were too short, 7 were underweight, and 4 did not have eyesight that could be corrected.

CAPCOM In sports, the Alberta Oilers, that's Alberta and not Houston Oilers, these are the hockey ones, skated passed the Houston Arrows for a 3 to 2 victory here in Houston. And the Minnesota Vikings in the City of Minneapolis, came to terms on the lease agreement to play their games in a proposed stadium up there in the north. Oh I guess it's building a stadium to keep it from being too cold, instead of being too muggy like it is down here. And that's the news as you can see it's a slow news day and things are still moving very slowly down here.

SC

Thank you, Bob.

END OF TAPE

SC Bob, we realize it's tomorrow down there but this still might be appropriate. (All together) Happy birthday to you, happy birthday to you, happy birthday dear Bob, happy birthday to you.

CAPCOM Well, all I can say, it might be appropriate but it's not very musical.

SC (Laughter)

CAPCOM Thank you, guys.

SC Happy, Bob, happy. At least you know it's from the bottom of our - hearts.

CAPCOM And just to let you guys know that I'm not easily swayed and made soft by such shows of sentiment, I want to remind the CDR on the LMP that they're going to start collecting their urine from now on, and you shouldn't have been dumping it since 197:00.

SC Okay, we're in the process of changing over.

CAPCOM Okay, and cover the rope on the UV and the IR so we won't be dumping it anyway right now, tonight, right?

SC That's right.

CAPCOM And Jack, you're going to be on the biomed tonight?

SC Whose side are you on? Of course I am. Bob, I'm hooking up right now. I sort of rested my own personal sensors and I'm putting the mechanical ones on - electrical ones, I guess.

CAPCOM Okay, I tell you what. If you wait 6 minutes until after LOS to finish that, you'll leave the surgeon in suspense until you come around on air (garble). That'll help keep him awake.

SC Okay, I'll see what I can do one way or the other. It's not according to flight plan. Hey, Bob.

CAPCOM Go ahead.

SC Would you say what you said a little while ago about the waste - not waste dumps, but urine dumps?

CAPCOM Okay, as per the checklist, it says at 19 - 197 hours, CDR and LMP collect urine in UTSS until 208 hours, so until tomorrow morning. And I was just reminding you that you don't want to be hosing it overboard right now because the UB and IR covers are open and we presume since you have already done the waste water in the H2 purge on the backside, that sufficient time has passed to open them. My guess is that we sort of presumed that you weren't in the mode of dumping urine overboard.

SC Okay, that's fine. I was thinking of the BUSS collection then - that's fine.

CAPCOM Okay, and America, once you fellows finish your presleep checklist, you're to go for sleep. You're GO for LOS and we won't be saying anything to you when you come around the front side next time around, in case you've nodded off. Call us if you want to and we'll just let it be as if

we're finished with you for the night.

SC Okay, thank you, Robert. We're hastening to finish the checklist and get some sleep, and unless we have some problems or questions, we won't be talking to you until tomorrow.

CAPCOM Okay, talk to you tomorrow night.

SC Hey, Bob, on the biomed LMP, if it doesn't show up to my normal standards, it's because maybe the sensors have come off. I'm - I've put a little of the bacterial salve on them and they probably won't stick too well, but I'll do the best I can.

CAPCOM Okay.

SC Preventive medicine, Bob, not curative.

CAPCOM Okay, that'll make the surgeon happy.

SC And, before we fade out of sight, you might look at the biomed. Whoops, I've got one left.

CAPCOM We're in low pit rate, we can't see you right now.

PAO This is Apollo Control at 198 hours 45 minutes. We've had loss of signal on the 56th revolution. As you heard from CAPCOM Bob Parker, we do not intend to put in a call to the crew on the next acquisition, nor does the crew expect to call us. We'll take the line down and come back up with hourly reports.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/15/72 GET 199:52 CST 0444 MC 799/1

PAO This is Apollo Control at 199 hours
52 minutes. America is coming up over the landing site now
on its 57th revolution. The crew began rest period almost an
hour ago. We have not talked to them on this revolution.
Rest period due to last 8 hours with wakeup at 207 hours
elapsed time. All systems continue to function well on the
America. At 199 hours 52 minutes this is Mission Control
Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/15/72 GET 200:53 CST 5:45 MC 800/1

PAO This is Apollo Control at 200 hours 53 minutes.
America behind the Moon now. We'll next acquire in about
35 minutes on the 58th revolution. The crew is in a rest period
and at loss of signal on this revolution all systems were performing
well. At 200 hours 53 minutes, this is Mission Control Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/15/72 GET 201:52 CST 0645 MC 801/1

PAO This is Apollo Control at 201 hours
52 minutes. Apollo 17 is in its 58th lunar revolution and
at this time is over the Taurus-Littrow landing site. We are
monitoring systems via telemetry. All going well aboard the
spacecraft. Crew has 5 hours 37 minutes remaining in this
rest period. America's current orbit 65 by 62.5 nautical
miles. At 201 hours 52 minutes this is Mission Control
Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/15/72 08:41 CST 203:48 GET MC-803/1

PAO This is Apollo Control at 203 hours 48 minutes. Revolution number 59 for Apollo 17 spacecraft, now in lunar orbit with some 3 hours and 41 minutes remaining until the three crewmen are awakened, for a rather full day of lunar orbit science activities. The spacecraft currently is in a almost circular lunar orbit: 62.6 nautical at the pericyntion by 65.1 nautical miles apocynthion. Orbital velocity 5344 feet per second, no apparent systems problems being monitored on the ground aboard the America at this time, and the crew sound asleep according to the surgeon, and at 203:49, this is Apollo Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/15/72 10:00 CST 205:07 GET MC-804/1

PAO This is Apollo Control at 205 hours 7 minutes ground elapsed time. Coming up on the front side pass on revolution number 60, some 18 minutes remaining until spacecraft America re-appears on the front side of the Moon. Two hours and 22 minutes remaining until the crew's awakened. America at the present time is in an orbit measuring 65.1 by 62.6 nautical miles. Here in the control center, the Flight Controllers are those that aren't busy planning the days activity are watching a playback of the rendezvous and docking sequence from the command module television camera which is being piped to the news room at this time on the monitors. And at 205 hours 7 minutes ground elapsed time, this is Apollo Control.

END OF TAPE

PAO This is Apollo Control at 205 hours 47 minutes ground elapsed time. The spacecraft America coming up on the old Taurus-Littrow landing site, where the descent stage of the Lunar Module, Challenger, rests as a monument to the final Mission of the Apollo Landing series, Lunar Landing series. Fifty two minutes remaining until America passes behind the Moon, being the end of the 60th Lunar Orbit. An hour and 41 minutes until the crew awake time. America presently, is in an orbit measuring 62.5 at low point at which point it is at the moment, at pericyynthion. And 180 degrees around at the rear side of the Moon it will reach apocynthion some 3 miles higher 65 nautical, and at 205 hours 48 minutes ground elapsed time in the Mission of Apollo 17, this is Apollo Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/15/72 CST 11:39 GET 206:47 MC-806/1

PAO This is Apollo Control at 206 hours 47 minutes ground elapsed time. Spacecraft America, now behind the moon nearing the end of the 60th Lunar Orbit. Some 42 minutes remaining, until the first call is made to the crew on the spacecraft. Approximately 5 minutes after they come around on the front side of the Moon on revolution number 61. Currently, the orbital digital display here in the Mission Control Center shows the orbit measuring 69.2 by 71.8 which may or may not be the current orbit. If it is somebody has done a maneuver here. Here in the control center the flight controllers are going over the changes to the flight plan for the day's activities, getting all of the different entries, new entries to the flight plan sorted out and agreed upon. Preparation for crew wakeup. On second thought, disregard that earlier orbital measurement. I suspect this display maybe, is invalid at the moment. At 206:48 up again in 35 minutes, this is Apollo Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/15/72 12:16 CST 207:23 GET MC-807/1

PAO This is Apollo Control at 207 hours 23 minutes ground elapsed time in the mission of Apollo 17. Coming around in less than a minute on the front side pass in lunar orbit number 61 and approximately 5 and 1/2 minutes away from wake-up. The wake-up music during this mission has ranged from grand opera selections to a college war hymn. We'll wait and see what it will be this morning. Spacecraft America in an orbit now measuring 65.3 at apocynthion by 62.6 nautical miles at pericynthion. We'll stand by for first word of acquisition from the network controller. We've had acquisition of signal. Slightly under 4 minutes now until the scheduled wake-up call unless they are already awake. We'll bring up the air-ground circuit at this time and stand by for spacecraft communicators alarm clock at 207:26, and standing by, this is Apollo Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/15/72 12:26 CST 207:33 GET MC-808/1

CAPCOM (Music, "The First Time Ever I Saw Your Face".)

CAPCOM Good morning America, from the Gold Team here.

CAPCOM Good morning America, from the friendly

Gold Team standing by.

AMERICA You guys have finally learned how to wake somebody up.

CAPCOM Roger.

AMERICA Good morning Gold Team, this is the command module Pilot of the spaceship America, and we're ready to go to work again this morning.

CAPCOM Okay, well you don't have to do much for a while but eat and get squared away.

AMERICA Good morning down there, this is the commander of the spaceship America, and I'm glad to see that the capcom console is well guarded this morning.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/15/72, 12:36CST 207:43GET 809/1

SC Okay, the cap comm console was well guarded this morning.

SC Roger, yes indeed. You've got one gate here and I'm guarding it.

SC I'm a little bit disappointed, though - the music was good but I expected the Marine Hymn or something like that.

CAPCOM Oh, I wouldn't do that to you this early in the morning.

SC Better now and get it over with.

SC Has your flight director changed or is it the same little fellow back there.

CAPCOM No, we've got Neil back there and a whole new team since you went to bed.

SC Oh, that's right. Very good.

PAO Wake-up music today was Roberta Flack's rendition of The Last Time Ever I Saw Your Face.

SC Who selected that song, Joe Allen?

CAPCOM No, that's Neil's special. You've got Neil Hutchinson to blame on that one. I must say he had a lot of accomplices on that.

SC Yeah, Bob, I think maybe that's one of the best songs that's come out in the last ten years, if you ask me.

CAPCOM Roger.

SC But then you didn't ask.

SC Hey, Houston, America.

CAPCOM Go ahead.

SC I think mag QU is all gone. So I used the

RR.

CAPCOM Okay, Ron at 208:05 here we're going to delete that solar corona pass anyway. I've got a flight plan up date I'll give you at 208 there and we're going to have to delete that solar corona pass so forget it.

SC Okay.

SC In case you guys are wondering it looks like we finally might see the sun down here in Houston. It's clearing off except it's extremely cold - the temperature must be hovering right in the low 40's or maybe even the high 30's or maybe even lower.

SC Well, my goodness. I should have been watching the weather for you, Bob. We'll come and warm things up for you before long.

CAPCOM Roger.

END OF TAPE

CAPCOM America, Houston. We've got the flight plan update and a pan camera photo pad for the flight plan.
SC Okay, Houston. Stand by 1. I've got my hands full of PRD thing.

CAPCOM Okay, the only thing we want to tell you is don't do the solar corona, and we've already told you that. We'll get back with you later on that. If you want I'll read you the morning news.

SC Hey, okay. Go ahead.

CAPCOM Okay, there's been a temporary halt to the peace talks in Paris, and as we mentioned before, Henry Kissinger is in Washington and has conferred with President Nixon. A ceasefire proposal suggested by South Vietnamese government officials has been rejected by the U.S. White House News Secretary Ron Zeigler has declined to characterize the present Paris peace efforts, but did say there are still some obstacles to overcome. And we had another hijack attempt, a youthful Canadian, who hijacked an airliner in northern Canada was talked out of his escapade by his father. The youth had held 62 persons aboard the plane for a short while, then retained only 4 hostages for 10 hours. It appears that the United Mine Workers may have a new president. Maverick candidate Arnold @Miller retained a strong lead over Tony Boyle in the government supervised election. The transatlantic airfare price war that seems imminent, promises to be a real boon to the vacationer. It is now estimated that airfare may be as low as \$136.00 for the transatlantic fare in some special categories. Juan Peron has ended his month long visit to Argentina. An attempt was made to nominate him for the presidential election while he was there, but the move was declared illegal and he returned to Paraguay. A few other news highlights - the village of Rhonda, Switzerland is threatened by a half million ton portion of a glacier moving down a mountain. Willie Brandt has been sworn in as Chancellor of West Germany for his second term. Former President Truman remains seriously ill.

END OF TAPE

CAPCOM Chicago Mayor Daley has made an effort to halt further commercial development along Chicago's Lake Michigan waterfront. Comedian Bob Hope is set again for his annual tour of U.S. overseas military bases. His first Christmas show in the Far East is December 21. Now in the local news here, there's a good chance that Texans may soon legally put a bet down on a horse race. A state senate's studying - study committee has heard some heavy opposition to paramutual betting in Austin, but the proposal appears to have a good chance of approval. And if you follow the Tomball police force, who quit en masse a couple of days ago - Tomball has rehired three of the officers who quit, and two more of the police who walked out are seeking to be rehired. And just a note here - there was a little beautification of Houston. Some of the thousands of billboards that line main highways around Houston will be coming down after the first of the year. All signs must be licensed by the state and a fee paid after that time. Some of the sports news: Johnny Bench, the Cincinnati Reds catcher who had a benign spot removed from a lung Monday, is recovering nicely at Christ Hospital in Cincinnati. The star baseball player will remain hospitalized for about five more days. Brad Van Pelt of the Michigan State University defensive star won the Maxwell Club trophy as the year's top college football player. The Washington Redskin's Larry Brown took top honors as the top professional player of the year. Southern Methodist has apparently chosen a new football coach to succeed Hayden Fry, but University officials say an announcement won't come until week. Mark Spitz and Shane Gould, both top olympic swimmers, were honored as top athletes in the world by European sports writers. With this batch here, of course. There was no action last night in college basketball. The University of Houston is getting ready to play California tomorrow night. Joe Paterno, Penn State coach, has won the Walter Camp Football Foundation award as coach of the year. And it appears that Mike Tillamen of the Oilers may play out as option this year and this - Coach Bill Peterson says that it upsets his draft plans this coming year. And I've already updated the weather to you. I just might add a little parenthetical thought that it's really not that much in the news and all the news around here anyway has been Apollo 17 and your liftoff. We picked up the liftoff last night from the Moon and carried it live TV for about 2-1/2 minutes as you went out of sight like a star, and then of course, live TV picked up your docking and rendezvous and docking. A very spectacular picture, I might add, of the lunar surface as the Challenger came up to meet America. Over.

AMERICA Very good news summary, Bob. Thank you. I didn't realize Tomball had five policemen. (Laughter)

CAPCOM America, Houston.

CAPCOM America, this is Houston.

AMERICA Go ahead.

CAPCOM Hey, you can probably tell by the comm that this is Jerry. The Gold Team has been handled over to the able hands of Neil. Before things go too far, I'll be around watching for the rest of the flight, of course, but before things got too far I wanted to pass my comments on to you guys that, boy, it's really been super. You guys have - between the performance of you guys and the performance of the hardware, it's been a piece of cake down here. I hope it's staying that same way up there, and we're really looking forward to finishing this thing up and getting you back home, and my hat's off to you.

AMERICA Okay, Jerry, I appreciate those words, but any performance of ours, and certainly that of the hardware, has to go all to the performance of you guys down there, because you know, you are the guys that make it happen and we do appreciate it. And I guess this is sort of a semi-retirement for you then, is that right?

CAPCOM Well, I don't know whether to call it semi-retirement. It's a relaxed feeling, I'll tell you that. But I'm anxious to do it again, and hoping to get a chance to do something more like this.

AMERICA You betcha we're all going to keep doing it, and listen you couldn't have left it in a more able set of hands than Neil's down there. We'll have to celebrate your 3 day or 4 day rest period when we get back.

CAPCOM Rog. Talk to you later.

AMERICA I didn't realize we wore you out.

CAPCOM I will throw one thing right quick, you know the activation descent bay, that was the third one I had handled, and including all the simulations and all the three of the actual flight, I think it's the first time we can say we really did it all right. For one reason or another, it really turned out to be a fairly easy day and I was really surprised.

AMERICA Jerry, that spacecraft that we were working with was undoubtedly the best vehicle along with America that I've ever flown.

CAPCOM Okzy, well I'll be talking to you later.

AMERICA Still with you, babe. Jerry, this is Jack. Thanks a lot, boy.

CAPCOM You bet.

AMERICA Okay, Houston, America. Would you like us to start charging battery Bravo?

CAPCOM That's affirmed if you're there, we'd like it.

AMERICA I'm here.

END OF TAPE

SC Okay, Houston we're going to do the pan camera, standby.

CAPCOM Okay, say again Jim.

SC Mode is standby and Houston mark. Power - and if you're curious VOH is high altitude.

CAPCOM Roger, copy that.

SC Okay, Houston, America I've got some medical logs and -

CAPCOM Okay, standby one.

CAPCOM Okay, go ahead. We're listening.

SC Okay, I'll start out with LMP medical log. PRD is packed down there with the suit and we'll have to get it later. He had 6 hours of good sleep. Took a seconal. Fluids - had lots of fluids - but they weren't logged. Okay, LMP's - okay day 10, I guess, meal Charlie. Had turkey and gravy, and I need to start writing, oh, has a citrus beverage, coffee, fruit cake, meatballs, lemon pudding and lemonade. Hey, Houston, instead of a turkey and gravy that was really a beef and gravy.

CAPCOM Okay.

SC Okay, we'll go over to the CMP. Meal A had bacon squares, scrambled eggs, orange juice, and coffee, vitamin, Meal B, piece of lightning (laughter) Meal B is chicken and rice soup, meat balls with sauce, butterscotch pudding, orange drink, carmel candy, apricot cereal cubes, brownies. I guess that was it. Meal Charlie, potato soup, beef and gravy, ambrosia peaches there - about half of it - 4 brownies and an orange drink. Okay, on the medical log - PRD is 150 47 and I had about 6-1/2 hours of sleep in oh, cat naps I guess - some of them were a couple hours long. And had two sniffs of nose drops on each side prior to going to sleep and 5 cans of fluid. Okay, for the commander's menu - how do we get to day 10 - day nine yesterday -

CAPCOM Ron, excuse us - would you have somebody turn the pan camera to OFF, please.

SC Mark it. It's off.

CAPCOM Roger, we'd like the IR cover closed and the UV cover closed at this time.

SC Okay. How I improved Rod.

SC Makes a little training - there's a little training once you get back from the lunar surface.

SC Okay, Houston UV cover is closed - it's gray. IR cover is closed and gray.

SC Okay. Ready for commander's menu, day 9, meal Charlie.

SC Houston, America, are you all set to copy?

CAPCOM Yeah, we're ready to copy, Ron.

SC Hello, Houston, how do you read America.

CAPCOM Pete's out there. We're ready to copy.

SC Okay, here we go. For the commander's day 9 meal Charlie, meat balls, butterscotch pudding, beef and gravy,

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orange-pineapple juice, citrus juice, chicken stew, apricots and gingerbread. Okay, his medical log. He had seven hours of very good sleep. No medication and drank lots of fluids but nothing was lost on that part of it. And his PRD is also at his suit - down at the bottom of the suit bag so we ought to get it out here, shortly.

CAPCOM

Roger. Copy.

SC

Bob, in lieu of the solar corona photography,

I watched - Gene and I both watched it set and there are two bands which I still can see now a zodiacal light I guess, going out symmetrically on either side of the plane in the ecliptic and they make an angle between themselves of about let's say 70 to 80 degrees. I can still - knowing they are there - I can still pick up the bands, the streamers, I guess would be a better word and last night when I watched one set there was a strong linear streaker going out - oh, maybe 3 or 4 or 5 diameters - I'll have to get my directions straight. Well, I'll figure out which side of the ecliptic it was - that was not nearly so strong when I looked this time - now partly that may be dark adaptation, I don't know, but I'll try to keep track of that one. But these two streamers today are about an equal strength and they are still visible as zodiacal light.

CAPCOM

Okay, Jack, we'd - quick break, we'd like the high gain to AUTO and we'd like to get on with this flight plan update, please.

END OF TAPE

CAPCOM (garble) to AUTO and we'd like to get on with this flight plan update, please.

SC Okay, you've got AUTO.

CAPCOM Okay, and this is a realtime flight plan change. This realtime right here, and right now if you'll go mapping camera cover OPEN, and mapping camera EXTEND and give us a MARK, we'll time the extend time on it, please.

SC Okay, Bob, the mapping camera cover, ready -

CAPCOM Jack, did you go to reacq on the high gain?

SC Okay, we're in reacq.

SC Going retract.

SC (garble) wait a minute.

SC Oh, okay.

SC Okay, Bob. Mapping camera is going OPEN. Mark. And it's grey. And you want to extend the mapping camera, huh?

CAPCOM AUTO and high gain, first of all.

SC Okay, that's what they said they wanted. Okay, going to AUTO again.

CAPCOM Okay.

SC Houston, America. You say you're going to extend the mapping camera, now?

CAPCOM That's affirmative, we're extending it early cause we want to time it, and extend it now, please and give us a mark when you start it.

SC Okay, mark it.

CAPCOM Okay, and might as well finish up the flight plan updates if you don't mind. The next one is at 20901.

SC Okay, go ahead, 20901.

CAPCOM You're going to delete the mapping camera laser altimeter cover open and mapping camera extend, at that position cause you've just done it. Just scratch them out.

SC Okay, Bob. I got that.

CAPCOM Okay, and at 20903 - add after pan camera power - add V over H override high altitude.

SC Okay, I got that V over h high alt at 20903.

CAPCOM That's affirmative, and -

SC Hey, Houston, America.

CAPCOM Go ahead, Ron.

SC Okay, let me interrupt here a minute, Bob. Can we go ahead and dump with the mapping camera extended?

CAPCOM That's affirmative, Ron.

SC Okay, mighty fine, thank you.

CAPCOM Okay, we'll just show a full extend at 20940, Jack, in the flight plan where it says liftoff time update is not required. At 20940, we'll not do a liftoff time update.

SC 20940. You're not going to do a lift-off time update, huh?

CAPCOM That's affirmative. And I've got a pan camera pad while you're on that page. The pan camera pad which is opposite 209 15- 209 15.

SC 209 15 pan camera photo pad. Go ahead.

CAPCOM Okay, T-start 2091444, T-stop 2092736, and that covers all of it. We can settle back to the flight plan now.

SC Okay, we - I will do that.

CAPCOM Okay, sir, and if you'll give us ACCEPT, we've got a state vector at this time for you.

SC Okay, you have it.

CAPCOM Okay, and Ron, you may be interested, we had a nominal extend on the mapper.

SC Hey, great. I guess once the door stays out of the way, it'll come out alright, huh?

CAPCOM Right.

CAPCOM America, Houston.

SC Go ahead.

CAPCOM Okay, Ron. Just for - first of all - the computer is yours, you can go back to block. Just for your information, at the beginning of the next rev we're going to have a flight plan update. Or actually, we'll have a pan camera pad at the beginning of the rev and then into the rev after the orbital science visuals, we'll have a flight plan update. What we're going to be doing is - we're going to be doing an extra ultraviolet scan program and we're going to do some antenna calibration on the HF and lunar sounder antenna so we got quite a lengthy flight plan update and after that it'll just be flying the flight plan. The thing with the lunar sounder is that we're getting a lot of noise from earth that we don't see on the back side of the Moon in the HF and we'd like to calibrate this out.

SC Okay, you want to give us those updates now or are you going to -

CAPCOM Negative, we'll wait until next rev, they're not that extensive - we just have a number of them. We want you to be aware that they'll be coming up. They will not interrupt your orbital science visual targets there at Mare Smythii or at the landing site visual.

SC Okay.

END OF TAPE

CAPCOM America, Houston. You're about 2 minutes from LOS here. We've got 2 items - the America is looking great and as you go around the horn there's no problems open on it. If you do - we would like the LMP - Jack, if you'd push on your EKG sensor a little bit - we're - data isn't too good - the EKG sensors. And on your H2 tank configuration, Ron, we'd like you to take H2 tank 3 fans to OFF and H2 tank 2 fans to ON.

SC Okay. Tank 3 is OFF. Tank 2 is ON.

CAPCOM Roger.

SC Okay, Bob. First break I have I'll change - have to change those sensors. I - I needed to put that salve on and I didn't. That's probably the same problem as on the way out.

CAPCOM Roger. Don't change them Jack. The CMP is due to come on before too long so just press on them and see if we can improve the data a little bit but don't change them out. And you're looking great and we'll pick you up again at 209:23.

SC Maybe that ratty data is me.

CAPCOM No, No, it's not that way.

PAO And we've had loss of signal as the spacecraft, America, passed behind the moon nearing the end of the 61st lunar orbit. Some 48 minutes until the spacecraft comes around again on revolution 62. During that frontside pass the crew was wakened very pleasantly by a recording uplink to them by Roberta Flack of The Last Time Ever I Saw Your Face. And after they had sufficiently wakened the flight plan updates for the days activity were read up to the crew by spacecraft communicator, Bob Overmeyer. Current orbit - 65 nautical miles by 62.5 pericyynthion and at 208:40 this is Apollo Control.

END OF TAPE

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PAO This is Apollo Control at 209 hours 22 minutes ground elapsed time. Apollo 17 Spacecraft America coasting around at this time on the start of lunar orbit number 62, 40 seconds away from acquisition by the ground station antennas. Still in a 62 by 65 nautical mile orbit. Waiting confirmation as the spacecraft comes around the corner. And we have, indeed, picked up the downlink voice and data signal at the tracking station. We have had acquisition. Let's stand by for the initial conversations.

SC Okay, we've got you OMNI D. Somehow we got off attitude here -

CAPCOM Okay, Ron, understand you're on OMNI D. You're coming up on 30 seconds away from pan camera D stop time. I have another pan camera pad I'd like to give you before we get into the GARBLE visual.

SC Okay. Geno, get the pad. 27 36 -
27 36 Jack:

SC Grab on the pan.

CAPCOM Okay, the pan camera photo pad is at 209 30 - 209 45 are you read for that one?

SC Standby - pan camera to standby. Okay, pan camera standby.

CAPCOM That should get it. Okay, the pan camera photo pad T start time 209 49 04, T stop time 209 51 01. Over.

SC Okay I've got T start of 209 49 04 and T stop 5101.

CAPCOM Roger, and we'll hold off on the other pads until after your visuals.

SC I don't have much to do anyway with Bob, what you said.

CAPCOM Rog, if you want we're ready to start GARBLE copy the visuals.

SC Okay, that's right. GARBLE. (static in background) Okay, we're coming across Mare Smythii, one of the first things I'm concentrating on is the - well, it's both of the GARBLE camera GARBLE high gain angle.

CAPCOM Roger, trying to get one.

SC Okay.

CAPCOM Ron if you'll do a standard reacq for the high gain GARBLE.

CAPCOM Sounds great.

SC How do you read, Bob.

CAPCOM Loud and clear.

SC Okay, Houston, how you?

SC Okay.

CAPCOM We'd like reacq on the high gain until we call auto, please.

SC Reacq in narrow gain.

CAPCOM Ron, we're standing by.

SC Okay, Houston on the - the crater is to the north of the Wright Brothers. The slope of the walls is steep - probably 45 degrees on the inside - it's a gradual slope on the

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outside slipping away from the crater. There is no apparent albedo differences in the ejecta or pattern annulus around the crater itself and we're looking specifically at the one to the northwest of the Wright Brothers now. There is a definite mare flow that is undated and it's a different color and you know that you have a light albedo to it now, it's kind of a grayish tan. It's a light grayish tan material that has flowed - and I can't tell - it almost looks like it's sloped down to the crater. There is an impact crater right at the breach of the crater which has nothing to do with the flow itself. The material in the - I'm almost outside of it already, I was going to say the material in the inner crater in these boulder ring structures down there - the material all the way in the center of it is comparable to the hummocky bumpy looking type stuff that is not really the mare - not the smooth mare of Smythii - but the other part of the mare is Smythii. And -

END OF TAPE

CAPCOM Are there any differences in the craters, Ron?
AMERICA Yeah, some of the craters are crystalline and you can't see the multi-ring structures on them. And some of them that are definitely impact craters, you know, that have the ejecta rings around them. I've got to study them a little bit more, it's really the first chance I've had to look at Smythii. Was there some comment about (garble) but I want to take a look at him a little bit more. Some of the multi-ring basins there - the walls are not delta shaped at all. The one to the north and let's see, as you look to the right (garble) there's one directly north and then the next one, and then the next one. One directly north we'll say is 12 o'clock; the other one is 1 o'clock; and then a 2 o'clock crater. The 1 o'clock crater looks to me there is a high lava mark around the outer basin, the outer ring of the crater itself. The one at 12 o'clock is the one I was talking about, has the breach on it with the later impact, the small impact crater on it. And without the binoculars I couldn't tell flow direction whether they were flowing into the multi-ring basin from that mare patch on the outside or vice versa, so I'm going to try to check that out next time around.

CAPCOM Okay, Ron, we're standing by for any comments along your ground track here and we're following you. We would like to - when you get up on the landing site, we'd like you to concentrate on Stoney and F crater. F crater where those textural differences we noticed the other day.

AMERICA Okay. Bernie, I think - right, I called the Stoney the other day too I think but -

CAPCOM Bernie, yeah, Shorty, I'm sorry.

AMERICA The one out on the land slide.

CAPCOM All right, we want you to mark the breach that you see on the photo, please. Or on the map.

AMERICA Okay, that's that's the breach on the - on Mare Smythii.

CAPCOM That's affirm, Ron. And Ron, if you'll ask Gene or Jack or somebody to get your pan camera to mono now, please.

AMERICA Okay, pan camera's going to mono.

AMERICA Okay, good. (Garble) as much as stick 'um. I got the binoc's.

CAPCOM And Ron, we're still standing by for any calls you might want to make enroute to the landing site.

AMERICA Okay. Well again you can speak of text- or color - the differences on the thing. And the sun angle now looking west you get the same streaked - well, the verticle streaks that I talked about before that you see on the back side at the high sun angle - higher sun angles again. And that seems to show up more and more, I think, at the higher sun angle. And these are the - what I call radial - radial streaks down in the fresh craters that essentially start at the top of the crater rim and go down inside of them. If you take a look at these streaks, I don't - I don't

AMERICA see how they could be due strictly to the sun angle on them, I think, because they're all the way around the crater.

CAPCOM Roger, did you have a particular crater in mind along the -

AMERICA No, and they would -- Well, I'm trying to find the name of it right now. It doesn't make any difference which one it is. It's in all of the -- all the craters, all the valleys, and everything, and it looks like the Sculptured Hills around the landing site.

CAPCOM Roger. We understand there.

CAPCOM Set one up at AP Polonius. That area now (garble).

AMERICA Yep.

CAPCOM Is there any significance -- any difference between the contact of Crisium to the Highlands or is the (garble) in that -- the area where you're flying over Mare Tran -- Fertility? And, the Highlands right there between the two contact points?

AMERICA No, the Highlands look essentially the same as you -- as you pass from Crisium on across to Fertility, and, again, they look so much like the Sculptured Hills, it's ridiculous (garble). It's all the high sun -- high sun angle again. You got the streaks and the highs and there -- there are masses of Highlands, though, on the border of Crisium here, though that -- although they look like the Sculptured Hills, the sculpturing seems to be radially upslope and then downslope from the center of Crisium and just in small local areas of the Highlands.

CAPCOM Roger, roger. Do you see any (garble) --

AMERICA In that way, I think they do differ from the Sculptured Hills.

CAPCOM -- Fra Mauro (garble)?

AMERICA No, Bob, the one I'm referring to is on the Highlands bordering Crisium, but in about all of them you do see a definite radial pattern upslope and downslope. From the center of Crisium, but none of the lineaments like you're talking about like at Fra Mauro.

CAPCOM Roger, copy.

AMERICA Kind of film -- oh, I got the wrong film in the mag. (Garble) Let's see, there's Xerxes, and then, to the side of the slope, come Xerxes, then there's about a 50-kilometer crater, then there's a subdued crater, and right on the western rim of Crisium, the western edge of that subdued crater, it's almost a 70-degree slope down there, and it's a square straight slope on the thing. There doesn't seem to be any ejecta piled up in the bottom of it at all, but within the slope, and it must be 50 -- about -- yeah, 50 kilometers long, and there's a bright impact crater on the top of the hill, top of the rim, right below that bright crater, you have the tannish brown streak that goes through the whole slide.

END OF TAPE

SC Go through the whole slide. The rest of the slope itself is the bright light - real light light tan, I call it. I'll find the name of that crater on the map in a minute. I think the circumference of that crater right there ceases to be round - it just is squared off with a linear brink about oh - at least 20 percent of the circumference of the entire crater.

CAPCOM Now are you talking about a crater on the Mare of Crisium or are you talking about up near Barocius P in that area.

SC Yes, it's right - no it's right on the mare. A subdued crater right on the Mare of Crisium just below Yerkes.

SC Jack, where's the -

SC Oh, the film - (garble)

SC Window 3 is a good one. Glare is (garbled)

SC Ah, let's see, F8 at 250, right here.

CAPCOM Very shortly you should be coming up on the mare prior to the landing site across Tranquillitatis and then to the landing site.

SC Oh, yes, that's affirm, we just, I got Proclus at the window No. 3 now.

SC Yeah

SC Yeah, the landing site really shows up - even from this distance right now we're right over Proclus and looking off across off down through the hills there, you have a definite dark and now the albedo or the colored texture of the thing to me is turning more of a gray than a tan-gray. In the early parts of it I thought it was a dark grayish tan I guess or something like that. Now it looks to me like it's more tan - I mean more gray. I'm sorry, It has essentially the same -

CAPCOM On (garbled)

SC Ah, not yet.

SC Yeah, this is Gene. I've got it on and the streaked albedo changed differences very definitely. One is the dark mantle on the floor. One is the South and North Massif and the other is the Sculptured Hills. And the Sculptured Hills are at a light gray albedo between the Massiff and the dark mantle. It is not very evident and there's a definite break in slope that you can. The South Massif (garbled) slide, but the white mantle is out on the valley floor. And from here Shorty stands out like a sore thumb.

CAPCOM Okay, we're interested in all three of you on that colored texture difference up at Shorty and then we'd like to have a comparison from Shorty to F Crater if it is possible.

SC Okay, that crater is a harder than a son of a buck to find. That crater is right on Family Mountain and there's one to the north of Family Mountain or a little

ways there's a darker crater and then there's also one to the south of it. I can't find one on Family Mountain at all. I couldn't the other day so I'm going to see if I can find it today.

SC Bob, to me the Sculptured Hills incorporate the albedo, both of the North Massif, or the Massif and the mantle area and combine them to give you a generally in between gray albedo but the sculpturing is produced by the darker albedo that looks like the mantle, and the lighter albedo that looks like the massif.

CAPCOM Roger. And for Ron, the F crater is just to the south of Family Mountain. It's the one that you mentioned south of Family Mountain.

SC (garbled)

SC Ohhh, okay. That's the one I saw the other day. It looks about like Shorty.

CAPCOM Is there any -

SC From here Bob, they're both very dark

CAPCOM Is there color differences up -

SC Have to check that just a second.

CAPCOM Okay, and we're about 30 seconds from the start time on the pan camera.

SC Can't see that far standby.

SC There is a definite bright spot up on the side of the hill with the - almost the extension of that slide area from Shorty.

CAPCOM Hey, you guys, we're about 10 seconds from the start time on the pan camera.

SC Yeah, Jack's getting the T start. Okay I still get a -

CAPCOM Mark T start time.

SC It's an -

CAPCOM Go ahead, Ron.

SC Okay, on Shorty I still have the light and orangish tan type of material that is essentially perpendicular to the line of the slide area there in the northern semi-circle. Another thing I see F crater - boy, I can't hold these crazy glasses still enough.

CAPCOM Okay, let me read you some questions about F crater if you will. If you'll direct your attention to F crater, we'd like to know the shape of the crater profile, the rim crest and probable or possible breaching, the smoothness and distribution of rim deposits and the superposition relationship with Family Mountain or Family Hill.

SC Okay. Now those - it is a - by golly there is a raised rim to it. It's light colored down inside

the crater though. And I can't hold the glasses close enough to see if it's breached or not.

SC God, I can't see any more, but let me add to it what I can remember real quick, the inside is white, the outside is red with a it's just a - the rim itself is dark, very dark, there's some white to the south about a crater diameter, sort of a - small distribution radially to the south and then there's a sort of a what I would call a pre-patterned dark light gray about 2 crater diameters maybe 3 crater diameters, to the south just slightly to the west of this light area were talking about, but to the south, another definite one to the west and another definite one to the north, but not to the east.

CAPCOM You just past pan camera, I stop time guys. Jack, pan camera to standby, please. Go on Gene, sorry to interrupt.

SC Just got it.

CAPCOM Go ahead, go ahead with your description

SC I going to draw a picture here while I'm thinking of it.

CAPCOM Okay, good show. Hey, guys, that completed the orbital science visual pass. Are there any other comments you'd want to make about the landing site.

SC Yeah. It's an interesting place.

CAPCOM Naw, not that. Geological -

SC Yeah, I've got some more - well my white spot there is (garbled) the same spot, there's two white spots I'm talking about. Now the one I'm talking about primarily is the one I saw right after landing, on the thing was a lighter grayish area that was evidently blown up from the

END OF TAPE

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SC Top of the LM landing does that go on the same spot? You can still see that all right.

CAPCOM We'd like pan camera power to OFF now.

SC Okay, it's OFF.

CAPCOM M Okay, Ron, anytime you're ready now I've got a - that whole series of flight plan updates and I've got a few words of explanation with each one so maybe you might want to take these.

SC Okay.

CAPCOM Okay, high gain to AUTO.

SC High gain's in AUTO.

CAPCOM Yeah, one more question, how large is the bright zone you were talking about, Ron?

SC Right between Sherlock and Camelot there are two small craters there and I'll have to get my map out to look up the name of them for sure. Oop - they should have been behind the LM - right behind the LM. And the bright spot is about the same size as those.

CAPCOM Okay.

SC And I would say equilateral triangle with those two craters.

CAPCOM Okay, fine. I would recommend one of you go on to the configured camera while we start the Flight Plan update. We'd like to get the Flight Plan update all read prior to that P52 that you've got to do there, and somebody will be taking those terminator photos.

SC Okay, soon as Gene, Gene's drawing the flight plan there. Okay, ready for a Flight Plan update.

CAPCOM Okay. Who's going to take the terminator photos. You want me to give you call about 2 minutes before the photo time?

SC Yes. Jack will.

CAPCOM Okay, well, here's the Flight Plan update. At 210:30 add the following: mapping camera OFF, wait 30 seconds mapping camera stand by, image motion OFF, laser altimeter OFF, select P00 P00, V (garble) 49 maneuver to UV scan attitude. The angles are as follows: 167, 125, 354. Over.

SC Okay. Mapping camera off. This is at 210:30. Mapping camera OFF. Wait 30 seconds mapping camera to stand by, image motion to OFF, laser altimeter OFF, P00, V49 to UV scan attitude. Roll 167, pitch 125, yaw 354.

CAPCOM Good call, Ron. The next one is at 210:35 and this is a P20 maneuver that's going to set up a rotation about the X axis for a UV scan. You copy?

SC Okay.

CAPCOM P20, option 2, UV scan. NOUN 78 all zeros 000. NOUN 79 minus 0.4000 plus 000.50, NOUN 34 0021000042019.00. Over.

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SC Okay, P2 (garble) , at 10:35, will be (garble) for UV scan option 2. NOUN 78 are all zeros, NOUN 79 are minus .4 of a degrees per second. Is that right?

CAPCOM That's affirm.

SC Minus 0.4000. Okay, then dead band is at .5 and a half degrees. NOUN 34 is 2104219.00.

CAPCOM That's affirmative, Ron. Okay, at 210:41.

SC Okay, 210:41.

CAPCOM Add the line, the standard line, verify DSE tape motion, high bit rate record forward command reset.

SC Okay, at 41, verify tape motion high bit rate record forward command reset.

CAPCOM Roger. At 210:57, you've got another P20, Ron. And this P20 will set up the orb rate minus sight on the horizon. Okay, here's the P20, option 5. NOUN 78 plus 16201, let me read that again, plus 162.01 plus 040.76 plus 184.78. NOUN 79 plus 000.50 and we're going to orb rate around the Moon, so NOUN 70 will have a 50 in it for the Moon.

SC Okay, at 57, it will be P20 option 5. Now, orb rate minus sight on horizon, NOUN 78's a plus 162.01 plus 40.76 and plus 184.78. NOUN 79 a half degree and it'll be orb rate around the Moon 50. Okay?

CAPCOM Roger, Ron. Okay. Stand by.

SC Bob, while I'm standing by, oh, that's alright.

CAPCOM Okay, Ron. We're ready with some more if you are.

SC Okay, go.

CAPCOM Okay, at 211:02. Add the following at 211:02: UV cover closed, and in parenthesis put 2110209. Configure DSE

SC Good, we're going to close ... oh, ... That's alright, go ahead.

CAPCOM Configure DSE, stop/command reset. Select P00. Manual roll left to a roll angle 039 by 21105. Over.

SC Okay, UV cover closed at 2110209. Configure the DSE stop command reset. Whip her into P00 and manually roll it to 039

END OF TAPE

SC REV to P00 and then we roll that to 039
by 211 plus 05.

CAPCOM Rog. And just the prediction from the simulator, you might want to use the excell command for a rate of about 1 degree per second to accomplish that. And the purpose of that is to get the sun out of the mapping camera.

SC Okay. Can do, excell command to 1 degree per second.

CAPCOM Okay, at 211:08.

SC Just a second, Gordy. Hey, Jack on here it shows the little circles on the map, which part (garble) pretty soon? REV 2 or what ever it is.

CAPCOM One REV -

SC Except for some reason, my map D doesn't - Yeah. On map DELTA. I must have got the backup map or something, I didn't have any of the portable - the camera settings, on it. (Laughter). Terminator hose -

CAPCOM Ron, we can break from this now, we're pretty well ahead now, and we can come back to it, if you want to do the photos.

SC Do you have any options there on La Hire Rille? And if not La Hire, what the photo settings are.

CAPCOM Roger, I'll read them to you right off the map.

SC Okay.

CAPCOM Okay, if you're looking right at the map, draw a circle around La Hire BRAVO. And that is F-32

SC Oh, I've got the circle around it.

CAPCOM 1 500.

SC Good. F-32, 1 500. Okay, start with that one Jack.

CAPCOM Got the circle around MT LaHire, it's F-11.

SC 250 millimeters lens. - F-11, okay.

CAPCOM At the next circle up, which crosses, which encompasses the La of La Hire Rills, you want F-8 at 1 250.

SC Okay.

CAPCOM And the one that crosses the circle that covers across the terminator there, at Diophantus, is F-5.6 at 1125th, 1125th.

SC Okay, we got them all, Bob. Thank you.

CAPCOM Okay, just a question for some other period where we have to (garble) that for P-66 and P-74 REVS.

SC Yeah. Don't have anything on this map.

CAPCOM Okay, we'll schedule that in prior to those REVS, Ron.

SC Okay.

SC Okay, we're coming up on Timocharis, now. Look at the map there and get me, right along the La Hire Rill, see -

SC Take 6 6 6 shots you know, kind a in each area at that - yeah, north and south. Yeah, you know point them every which way, or whatever's interesting out there. Okay.

SC Okay. Mt. La Hire, you can get in there at F-11 at 1 500.

CAPCOM Hey, Ron. Just a point. -

SC There's (garble) coming up there.

Okay, go ahead, Bob.

CAPCOM Do you have 2 copies of the maps onboard, and if so, would the other copy of D have the updates on it? Or have the settings?

SC Got 2 copies? I didn't know we had 2 copies. Okay, and then next to order we've got F-8 at 1 250 (garble). There's ah, well we're just about - Okay, we're just about up there, On the terminator line. Yeah. No, F-8 at 250. Okay. North and south along terminator. You're getting close to it. Then, change to - right on the terminator change to F-5 .6 to 122. I was wondering when you guys were going to say that. (Laughter). Okay.

SC (Laughter) Yeah, that'll be a good one. I'll tell you it goes a lot easier when you're by yourself.

SC Okay, 1 MAG 55, I mean frame 55 and

MAG Romeo, Romeo.

SC Yeah, we didn't get some of the ones up around La Hire. We'll get those next time around.

CAPCOM How's the pictures going, Ron?

SC Okay, We got the pictures of Rover. And, that's Lunar Rover Chart DELTA. It doesn't have anything on it, you know, got the circles on it, but don't have anything yet.

CAPCOM Okay, we'll - We'll schedule it up - all the updates on that after you go LOS we'll figure out some convenient time to read them up to you on the other round.

SC Okay, and we're ready to continue the flight plan.

CAPCOM Okay. 211:08, 211:08.

SC Okay. We're all set.

CAPCOM Ron, just one comment before we start the flight plan. You've got a 52 coming up and we want to

CAPCOM make sure that gets done prior to the
VERB 49 maneuver 210:30. And there is no slack on that
VERB 49 maneuver at 210:30. So you'll have to get on to
the 52 at about 20, but we should have enough time to get
the rest of these updates up.

SC Okay.

CAPCOM Okay, Ron, at 211:08 delete the lines,
mapping camera off, wait 30 seconds, mapping camera standby
image motion OFF, and laser altimeter OFF. Delete those
lines.

SC Okay, they're deleted.

CAPCOM Okay, at 211:11, change the receive only
attitude to the following: roll 039, Pitch 159, Yaw 300.

SC Okay at 211:11, VERB 49 will be to 039,
159 and 300.

CAPCOM Okay. At 211:26 we're going to do a
P-20 maneuver and it's going to be a rolling P-20 which will
roll about the OMNI BRAVO line of sight to the Earth. We'll
need high bit rate during that time. That's why we need the
- line of BRAVO and we're doing the Earth study with the
lunar sounder to determine the polarization of the noise from
the Earth. So we can subtract it out of our Data. And during
these maneuvers you're going to see a little gimbal angle of
plus or minus 65 degrees. We saw that on the simulator, but
a word of caution that. You'll see a little gimbal angle plus
or minus 65 degrees.

END OF TAPE

CAPCOM The P20 maneuver is as follows at 211:26,
P20 -
SC Okay.
CAPCOM - option 2 HF SCAN, NOUN 78 plus 270.00
minus 03930, NOUN 79 minus 0.3000 plus 000.50, NOUN 34 is
all zeros.
SC Hold it there Bob.
CAPCOM Okay, roger.
SC I got your NOUN, I got fouled in the
NOUN 78's. Plus I'm going to need two of those so it's
NOUN 78 is plus 270.00 and a minus 039.30. Okay, your NOUN 79
are now say again.
CAPCOM Minus 0.3000.
SC Okay, three tenths of a degree per second.
CAPCOM Roger, .5, .5 after have to (garble).
SC Okay.
CAPCOM And, NOUN 34s are all zeros.
SC Okay, so your going to pro at 211:26 then,
right.
CAPCOM That's affirmative.
SC Okay.
CAPCOM Okay, Ron this next one actually we're
calling it 212:20, but the simulator came out at 212:18:40
just for information. And at the following stop scan at
roll 039.
SC Okay, stop scan at roll 039.
CAPCOM Rog, verb 49 maneuver to lunar sounder
receive only attitude. Roll 142 pitch 286 yaw 0.
SC Okay, verb 49 lunar sounder receive only,
roll 142, pitch 286, yaw 0.
CAPCOM Okay, and the last one is 213.03 configure
the DSE high bit rate record forward man reset.
SC Okay, at 213 was that 03?
CAPCOM 03 that is affirm.
SC Configure DSE high bit rate record forward
command. Okay.
CAPCOM Okay -
SC For the high bit rate record forward
plan reset.
CAPCOM Ron, we'll be - no more flight plan up-
dates we promise today and we'll be working -
SC Laughter.
CAPCOM - at delta getting that updated to you,
but everybody here thinks there's two maps onboard and I
think you're right. I think there is only one in there.
SC Oh really -
CAPCOM FAO thinks there is two.

SC Oh wait a minute. Jack said they put an extra one - okay well there were two. Jack just said he had one put on for him. I must have picked his up or something.

CAPCOM Okay, rog.

SC Mine must be in there somewhere. We'll look for it.

CAPCOM Okay, if you'll check that and tell us if we need to update you. We'll still plan the update, but if you've got it fine.

SC Okay.

CAPCOM And it looks like you ought to be getting in your P52 when you get a chance here.

SC Yes, I'll get her down here. (Huming). Can't tell about these geologists. They put on extra maps in your spacecraft and things like that you know. I gave you the last frame number on that romeo romeo, but I think I forgot to tell you the one after the other one. Oh, by the way on the other one Agassiz was completely in the darkness and there was no crater rim at all to shine down on Agassiz so we didn't get him at all.

CAPCOM We copy that.

SC Oh, are we in P20 go free. We use to be in P20 - let's go back into P20. Not much but (garble).

SC They go right along here. I have them right along here it showed them down over there is what they used to do with them. (Garble) called get into auto now see the auto deadband.

SC Okay, are we at - AGS going and everything okay go CMC free now. Okay. That's my fault Gene I should have gotten it. (Laughter). That's right - number 12 Rigel hey I can find Rigel I bet you. There she comes. There's Orion. Man oh man I've done P52 already and it's within the half of the crosshair with - come on Alphard. Ah ha there's Alphard - on rev 62. Fine there baby.

SC Well up to my usual tricks (laughter). Ah, 12 and 21 - thrust forward 21, triangle difference five balls. Okay, Houston there is the NOUN 93's.

CAPCOM Rog, we copied them down.

END OF TAPE

AMERICA Okay, and we'll torque them at 2245.
CAPCOM We copy.
AMERICA Okay.
AMERICA Here's the auto now.
AMERICA Yeah, just a second, Gene. Let me look at it.
See resolve (garble). (garble) power is off. Those the old
optics? Yeah. (Laughter) Outstanding idea having a great
drink. (Laughter) Okay, 24. (Garble) Okay.
CAPCOM Houston, America.
CAPCOM Say again.
AMERICA Okay. Hey, Bob, how many frames of Mag RR
do we have to diddle with? Got a -- our own, or are there any?
CAPCOM That's in work right now.
AMERICA Okay. Uh huh, here's another Chart D.
CAPCOM I do owe you a consumables status yet, and --
AMERICA Hey, you know -- put all the stuff in it.
Hey, do we -- we have a good chart Delta.
CAPCOM Okay. Good. Great. I owe you a consumables
status, and when you woke up, you were right on the flight plan
line, and you had 58 percent remaining of RCS. And, all other
consumables are on the line or above.
AMERICA Okay. Hey, Bob. Sorry we didn't let you get
that in. We're not moving too fast for you, are we? (Laughter)
CAPCOM Uh, Ron, you have zero spares on RR. No -- no
film available for yourself on RR.
AMERICA Oh, okay. We'll --
AMERICA Hey, Bob, this is Jack. If you can possibly
swing it, I would strongly recommend that we let Ron redo that
last terminator sequence if we can work it in the flight plan.
Because Gene and I may or may not have done what you wanted there,
and I know we missed the first couple of them.
AMERICA I'll -- I'll use the 35 millimeter. I still
got about 8 or 10 frames on the 35. (Garbled)
CAPCOM Okay, we'll take that word under advisement,
and we'll evaluate it.
AMERICA Thank you. We may have to send you to the
U.N. with that diplomacy.
CAPCOM Thanks a lot for your confidence, Geno.
AMERICA Garble. (Laughter)
AMERICA Glad to hear your voice down there, Bob.
AMERICA Garble.
AMERICA Okay, Houston. Mapping camera is off.
CAPCOM Roger, Ron.
CAPCOM Okay, we suggest you start that VERB 49 maneuver
at 210 30, or you'll be behind the eight ball there on time.
AMERICA Okay, image motion is coming off. Laser
altimeter is coming off.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/15/72 GET 210:32 CST 15:24 MC822/1

CAPCOM America, Houston. You're looking real
good here coming up to LOS and we'll see you at 211:22. You
look good.

SC Okay. Will do.

PAO This is Apollo Control. We've had loss
of signal. Apollo 17 spacecraft America has gone behind the
Moon nearing the end of revolution number 62. It will reappear
again in about 48 minutes on revolution 63. Presently the
orbit measures 62.4 by 65.2. Cabin pressure was holding steady
at 4.8 pounds per square inch aboard the spacecraft America.
The crew busily running some photographic assignments, both
with the Hand cameras in the cabin and the mapping and panorama
camera is back in the SIM bay of the Service Module. Members of
the white team of flight controllers beginning to drift in
to replace the off going gold team. And at 210 hours 39 minutes,
Ground Elapse Time, this is Apollo Control.

END OF TAPE

PAO This is Apollo Control at 211 hours 21 minutes. We are about 1 minute now from regaining radio contact with Apollo 17 as it comes around the eastern rim of the Moon on it's 63rd revolution. Here in Mission Control we've completed a shift handover. The Flight Director on this shift is Charles Lewis and our Spacecraft Communicator is Astronaut Gordon Fullerton. Flight Director Chuck Lewis has completed a status review for each of his flight controllers and from all around the room a - reports of everything nominal come back. During this shift two things of interest will be the firing of the explosive charges left on the lunar surface by the astronauts to SS scientists and determining the sub-surface structure. The first of these charges, designated charge No. 6 is scheduled to be detonated at about 212 hours 51 minutes. There is some latitude in this event and because of that we'll have the television camera on the lunar Rover up early to catch the event as - at it's earliest possible occurrence, which would be 212 hours 21 minutes and will leave it up through 213 hours 21 minutes.

SC Ah, yeah, just checking to see how the weather was doing there in Houston before you came into work.

CAPCOM Ah, it's kinda - bunch of high clouds cirrus, I guess, but it's down around 35 I'd say and pretty windy. So it's nippy when you're outside.

SC Ahhha. And Houston, how's my biomed looking?

CAPCOM About 10 seconds to your (garbled)

SC Okay, thank you.

CAPCOM America, we'd like the IR cover closed and I think there might be a chance the sun will get in it there.

SC Oh, and away we go.

SC Okay?

SC Okay, Gordy, and we're (garbled)

CAPCOM Okay.

CAPCOM Ron, your EKG looks good. The surgeon wandered how the irritation that you had mentioned because of the sensors, is it getting any better?

SC Well, it's - yeah, it gets better when you take 'em off and leave it off for a while and I put the cream on and looks like it lasts for about a day and every time I put it on I put it on at a different spot. And it takes about a day for it to get red and irritated.

SC And Gordo, for information that's not unique, we're all having that and taking 'em off is the best relief for it.

CAPCOM Okay.
CAPCOM America, I've got some words about what
you might use for optional corruptional photographs. Over.
SC Okay, yeah, let's write it down there.
SC Why don't you write it on the back page
or something like that so we'll know where it is.
SC Okay.
SC Ready to copy.
SC Okay, magazine RR has no spare frames
so if you want to take any photos, we are suggesting the
dac and the 75 mm lens, and using JJ which is very high
speed black and white. 98 percent of JJ is unscheduled.
Here's some settings you may use for terminator photo-
graphs over Mare use T 2.8 1/500 and infinity. For termin-
ator over Highlands use T 4 1/500 and infinity. And for
Tsiolkovsky on rev 74, that's GG at 232 58, that's some
time in the future here. We're suggesting using T 5.6 1/500
and infinity. Over.
SC Okay, Gordy, what was the F stop for
the Highlands on the terminator?
CAPCOMT Okay, the Highlands terminator is T 4

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/15/72 GET 211:31 CST 16:24 MC824/1

SC Okay, Gordo, what was the F dot for the
highland terminator?
CAPCOM Okay, the highlands terminator would be
T4. I guess that's the far side terminator, and the near side
terminator is over mare. That's the mare setting.
SC Okay.
SC Hello Houston, America. Is today Friday
down there?
CAPCOM America, Houston. I'm sorry. Say again
please.
SC Just wondering, Gordo, if today is Friday.
CAPCOM That's affirmative. It's Friday.
SC Okay, thank you.
CAPCOM Happens to be pay day. It's the 15th.
CAPCOM Jack, Houston. We see no need for you to
wear any of your Biomed sensors, if you'd rather take them off,
give your skin a rest. Feel free.
SC Okay, Gordy I've done that. And I'll wait
till my next time and put them on then.
CAPCOM Okay.

END OF TAPE

SC Gordie, how do you read LMP?

CAPCOM Loud and clear, Jack.

SC In a relatively quiet period, we're going to make a few comments about some of the things that cross the two big basins that we're getting very familiar with or actually three. Smythii, Crisium and Serenitatis and the degradation of the balls of the major ring and the lack of any obvious blanket structures. I think in contrast the Imbrium and Orientale which we've also had a pretty good look at Orientale and Earth shine on the earlier revs is quite striking - that contrast is quite striking to me at any rate. Also, within Orientale at least at the southeast - on the east southeast portions of the mare floor. The wrinkle ridge system is not nearly as well developed, but there is a wrinkle ridge system that roughly forms an inner floor ring at any rate.

CAPCOM Roger.

SC The front of the major ring at Crisium are strikeingly different than those of the Apennines just in their general slopes - sharpness of topographical features. And in any appearance of having even a hint of boulder fields on their slopes like we observed say on the south massif anything like that at least Serenitatis massif seems to locally show fairly major boulder fields on their flanks. And, I haven't seen any around Crisium yet maybe Ron's already talked to you about that, but I haven't seen any.

CAPCOM Okay.

SC Ah yeah, the craters now I'm speaking of the, Ron, of the front faces themselves. The rim - the face of the ring itself.

SC Oh, I see the ring itself okay, that's what you're talking about.

SC No a - it crater - fresh crater in the mare or a fresh crater in the blanket area - rim area will have boulders, Gordie, don't misunderstand me but the front faces the ring front face does not have boulders that I can see. And, I think boulders are pretty obvious when their there. We've seen them well defined on the central peaks of Seaquosky and I think any time you have a major boulder field you can see it with the minocular - with a 10 power minocular.

CAPCOM Roger.

SC Getting into areas that resemble in their surface texture the Sculptured Hills of the Taurus Littrow landing area. Here we're just passing - now where are we that would be. I got disoriented all of the sudden - Poculus is there. So it's in the ray excluded zone of Poculus where

SC there is a mare surface projecting up into the terrain it looks like Sculptured Hills and that mare has the distinct blueish gray color in contrast to the regolith associated with the Sculptured Hills between the Hills at least which is - let's call it a tanish gray. Quite a sharp color hue contrast to my eyes at any rate.

CAPCOM Roger.

SC Okay, that was a projection of Fecunditatis Mare I guess up in there. Sculptured Hills tend to have both a regional distribution and a structurally controlled distribution. The structurally - structural control being apparently related to the rims of old craters. For example, there is some sculptured hills appearing topographic materials that again in the ray excluded zone but out in Fecunditatis we find the rim of a fairly large flooded crater in Fecunditatis. And all of this may tie in with the possible - possibility that we saw at the landing site that Sculptured Hills are composed of an igneous gabbroic rock and these may represent local intrusions controlled by the structure of an old impact crater - extrusions controlled by the structure of the old impact crater.

CAPCOM Roger.

SC I've noticed now I'm getting a good view of where at Fecunditatis there is tannish - let's call it more of a brownish gray mare in contrast to blueish gray mare in Fecunditatis itself.

CAPCOM Roger.

SC And in the walls of some - of a large crater, I'll try to figure out which one it is in a minute. It's near the large crater that the Sculptured Hills define. You can see in the east wall or maybe northeast wall of that crater. An area of bluish gray material that is streaking the normal tan gray of that crater wall.

CAPCOM Roger.

END OF TAPE

CAPCOM This is a kind of one-sided discussion. I wish I was there so I could take a more active part.

SC That's all right. I just thought I'd fill in a few things. This isn't a good viewing attitude at all, and we get a few isolated views that may be worth commenting on. The contrast, in my eye anyway, between the three color units around the landing site is a -- let's call it a medium blueish grey to grey for the dark mantle; a light blue-grey for the annulus around Serenitatis; and then, a tan-grey for the Serenitatis Mare proper. And, in Dawes, you can see -- I think you can see that the overturned -- or the, the rim materials are made up of the brownish grey material, and the walls underneath those rims are the blueish grey, which is the age relationship suggested by topography. That'd be the lower unit in forming the rim with inverted stratigraphy.

CAPCOM Roger.

SC The light blue-grey annulus is also the locus of most of the circumferential grabens that Serenitatis is noted for is in that area. And, that's nothing new, but, in one place there's a very subdued flooded crater which seems to control a arcuate project -- or let's say a circular projection of the light blue-grey out over the tan-grey Mare. Most of the major wrinkle ridge system of Serenitatis, of course, is outside the annulus of blue-grey except locally, and one of those places was in the -- to the west of the Taurus-Littrow site. Although that wrinkle ridge system does -- I can see now as we look south of -- in the southern portions of Serenitatis that wrinkle ridge system does cross the contact between the blue-grey and the tan-grey. That's the light blue-grey and the tan-grey.

CAPCOM Okay.

SC The impression I've had in looking at all the Mare where the wrinkle ridge system are developed is that they're a late feature. They -- at least at low sun, and sometimes even at high sun, they have a very, very sharply defined ridges with steep slopes on either side that seem -- that, in general, give me the impression that they're constructional, possibly associated with some thrusting movement.

SC In the vicinity of Sulpicius Gallus, there are several small craters that look like impact craters that, believe it or not, have -- in my eye anyway, orange ejecta blankets.

CAPCOM Roger.

SC Yeah. Ron says that he -- that he already commented on those, and they look very obvious to me. No, I -- don't know, no, I don't think you can with those ones. We'll get a good view of them again in one of the other attitudes.

SC It's a light orange, obviously, not a -- that is in contrast to the brown-grey of the dark mantle in the vicinity of Sulpicius Gallus. There's a good one right down there. Now, that one looks like a constructional cone, that's orangeish. And, that's -- that's right out on a raised projection of the --

of the brown-grey dark mantle out onto the -- out onto the light blue-grey annulus material.

SC This southern and southwestern portion of Serenitatis has a general appearance of the Sculptured Hills, although the individual hills seem to be more widely spaced than around Taurus-Littrow. Once again, historically, we're passing over the landing site of Apollo -- or near the landing site of Apollo 15.

SC Tell Dave Scott that the north complex looks just as interesting as it ever did. It's going to remain with Emory Crater as one of the unknowns of the space program for awhile, I guess.

CAPCOM Roger.

SC Hey, Gordo, I've been looking at the landing site off and on the last few revs, and I'd like to get -- now that we've been there and back, your best guess of the exact position of what you think we landed. Because I think I've got it pinpointed pretty much though from here.

CAPCOM Okay. Stand by one.

PAO That question on the landing site location coming from Eugene Cernan.

SC This is one of the first opportunities that I've had to look closely at Archimedes, which is one of those craters that, in the early days of the lunar mapping program, helped establish some of the fundamental age relationships between the various units that were visible in the Earth-based photography. In this particular case, it related to the sequence of events that created Imbrium, cratered it, and then flooded it with Mare. And Archimedes is a completely circular - closed circle as a crater, and it is filled with Mare. And it in itself is superimposed on the -- one of the main benches of the Imbrium Crater.

END OF TAPE

SC Now, to have Mare filling that crater and actually filling all the depressions of approximately the same level in the vicinity of Mare - the large Mare region. It's one of the things that's suggested to many people that rather than single sources for Mare lavas, you have a multitude of sources in a very fractured lunar crust. Ultimate source in depth is still certainly a subject for controversy.

SC The ridge and valley structure of the Archimedes impact blanket is not covered by Mare and extends to the southeast out onto the Imbrium bench. That was also one of the pieces of evidence used in those early days of photo-geologic mapping of the Moon. You'll have to excuse the reminiscing, Gordy.

CAPCOM Rog.

SC And Houston, America, frame 150, 151 and 152 were taken of the Silphcius-Galois region with a 250 lens. 154 was taken at de Guldara and that's magazine Oscar Oscar.

CAPCOM Okay, Ron.

PAO This is Apollo Control at 212 hours 2 minutes and we've within the last couple of minutes had a report from the ALSEP officer here that we're seeing seismic activity on the seismic profiling experiment which indicates that our first charge may have detonated early, either that or a meteorite has struck within range to be recorded on the instrument and we'll be checking that first grenade charge 6, which is a one pounder, was scheduled to have been detonated at 212 hours 51 minutes. It does have a mechanical timer and from past experience we know that mechanical timer to have some variability and when it opens the window allowing a continuous firing command to get through and fire the charge.

SC Bessel in Serenitatis that Ron and I were looking at last night and I think he had commented on being layers in the ledges that were visible in the walls and I certainly concur with that.

SC Yeah, although we could not trace layers, individual layers from ledge to ledge within a coherent ledge the layers were traceable, and in one case I'm sure I could count 6 or 7 ledges, some - well, layers within a single ledge. Reason it reminded me of it was looking at Timacharis and I can not do that with Timocharis.

SC It looks like it's - those ledges, any ledges that may have been present as a result of the Imbrium Mare have since disappeared by weathering. That's lunar weathering of course. Of course down here in the Imbrium, southern Imbrium, is one of the better regions of the Moon to observe the wrinkle ridge systems or Mare ridges sometimes they're

called. And it's purely that, they're fairly sharply defined - quite sharply defined ridges that are wrinkled in their pattern -- continuous would be another term. And with sharply defined slopes on either side of the ridge. Sometimes they are flat top ridges. Sometimes they are more like spines. And occasionally you see 'em they'll almost appear to have vertical slopes on one wall or the other. The whole impression that I have any way, is that they're maybe a combination of structure and folding of the surface of the Mare. Construction on the surface and folding of that surface. And particularly interesting that they can do wherever they're - has apparently been an old sub-flooded crater. Yeah, did you want to get that sum -

SC They seem to be controlled by the shape of flooded old craters within the Imbrium basin. And I think that's a safe conclusion because you get the standard outlines shown by the rille - the ridges, excuse me. Some of them are polygonal and some of them are quite circular.

SC Ron, did you want to get these ridges, these rilles south of Eulea here?

SC Yeah.

SC Okay, they're coming up.

CAPCOM America, Houston.

SC Go ahead.

CAPCOM Okay. I guess the last team promised you no changes to the flight plan but they didn't say anything about changes to the changes and I've got one. At 15 minutes from now 212

SC Standby a minute.

CAPCOM --- in the flight plan. Might get that out and I'll give you a change.

SC Keep talking, Gordy.

CAPCOM Okay, at 212:20, you're to stop the roll at 39 degrees, and then do a VERB 49 to 142 and we want to change the PITCH to 268 and zero. That would be 142, 268 and zero.

SC Okay, I got that change and you want that about 18 - 212:18.

CAPCOM I - have to check back here. Yeah, I guess that's when it is.

SC Okay.

CAPCOM Also, as long as you've got the book and a pencil let me give you a few other one liners.

SC Yeah, I can operate and copy.

CAPCOM Okay. Let's see. The first one is at 214:55 and they want to add after that other stuff just above there: UV cover OPEN and IR cover OPEN.

SC Okay, at 214:55 you want UV and IR covers OPEN.

APOLLO 17 MISSION COMMENTARY 12/15/72 16:53 CST 212:00 GET 827/3
CAPCOM Rog. Turn the page at 215:37, change magazine
November November to Kilo Kilo.

SC Okay.

CAPCOM And, the reason I'm so slow in an answer
on that landing site position, is all I've got it in is
latitude and longitude, and I assume that you want it in good
coordinates. For your reference. One suggestion here was
you tell us and then we'll confirm your guess. I just ran
across couple updates. Back to 213:15 in the
flight plan I'll give you the lunar sounder pads, the two
of 'em on that page.

END OF TAPE

SC Okay, I'll get them. Go ahead.
CAPCOM Okay. T-start on the left hand one there, is 213 20 10 and T-stop is 213 24 20. Then the next one is, T-start of 213 41 40 and a T-stop of 213 59 54. Over.

SC Okay, Gordo, got them all. There all at 213 hours start is 20 10, stop 24 20, start is 41 40 and stop is 59 54.

CAPCOM Okay, good readback.

SC And, Gordo, I guess my best guess after looking down there from here is I've got a - the northeast chart of the lunar surface traverse (garble). And about 84. - correction about 83.3 and DELTA .5. We're right on the top of the o in Poppy. Looks to be about where we landed.

CAPCOM Okay, we got that.

SC And in thinking back, about what my intentions were, that looks like probably a very reasonable, reasonable suggestion, and the first thought I had about being close to Trident, I didn't think I was anywhere near that close and of course you can look out there and see a big hole, you don't know how big to dig when you're down there. That big hole out there might very easily could have been Poppy out at 9 o'clock.

CAPCOM Okay, Geno, from science we finally got it converted to your map coordinates and their guess was close. Their best guess with all the data considered is, 83.2 and DN 21, Delta, November 21.

SC That would definitely make sense -

SC That's pretty close to where the old LMP set up the first REG after landing, isn't it.

SC - north of where we put the - remember it was a little ways away, you were at the edge of a depression and it would (garble)

SC Yeah, I'll buy that. That's in my scatter and then that crater as I looked out at 9 o'clock we landed next to was actually Poppy. Pretty sure that's that large crater.

CAPCOM Okay.

SC And, Houston, America. On MAG Yankee, Yankee, use frames 31 thru 35, at that last Earth site terminator there.

CAPCOM Okay, Ron. Got that.

PAO This is Apollo Control. There is some debate in the Control Center at this time as to whether or not that first explosive charge did in fact fire early, or whether the seismic profiling experiment was instead a reacting on natural phenomenon, such as a meteorite impact or a Moon quake and we have brought up the television camera on the

PAO Lunar Rover early and we'll be looking at the area and attempting to draw some conclusions as to whether the aft charge did in fact go early or whether it's still in place. Now that question could be answered quite easily if the charge of course, explodes on command as it's scheduled to at about 212 hours, 51 minutes. And that first charge is 1-pound explosive charge about 1.1 kilometer from the Lunar Rover.

SC Gordo, I'm just going to stop this maneuver this time around at 39 degrees.

CAPCOM Okay, Gene. Say, we've got one question for Ron. We've got large teams of engineers trying to locate the missing scissors and we haven't asked you in a while whether you might have found them. It might save them a lot of effort down here.

SC No, I haven't found them yet. And there's a lot of room underneath these CO2 absorbers I found out the other night. Because, I lost my flash light but it's kind of floated out and I saw it every once in awhile. And, we found the flash light and got it back. But I still haven't the slightest idea where the scissors are.

SC Gordo, you might have someone hide them in the CSM and send a backup crew down to the Cape and see how long it takes them to find them.

CAPCOM Okay, I'll get an airplane schedule up right away.

SC I've just been 39 degrees, I'll wait for it next time around.

SC By the way Gordy, you working on next week's airplane schedule?

CAPCOM Yeah, what do you need? You mean the one from Hawaii back, or something like that?

SC Yeah, you might have some 38s waiting for us in LA, we can pick them up there.

CAPCOM Okay, but we'll have to work it three ways, swap with some Skylab troops that will be out there and Deke will meet you in Albuquerque half way back, and I'll let you know how it all works out.

SC That sounds great. That sounds like easier than usual.

PAO This is Apollo Control. We have a Press Briefing scheduled with the flight director from the previous shift, Neil Hutchenson. And that Press Briefing is scheduled to begin in about 5 minutes at 5:15 PM in the MSC News Center Briefing Room.

END OF TAPE

SC Every commander has the right to change
his mind.

SC And, Gordie I'll watch the cranapple.

CAPCOM Okay, Geno.

PAO This is Apollo control at 212 hours
28 minutes. We are ready to switch to the MSC news center
briefing room for the press conference press briefing with
flight director Neil Hutchinson. There is a possibility that
during this briefing we'll have the detonation of the first
seismic charge now on the lunar surface. If that occurs we'll
interrupt the press briefing to announce the firing of that
charge. We'll switch now to the MSC news center and our
press briefing.

END OF TAPE

PAO This is Apollo Control at 212 hours 39 minutes. During our press briefing, we had loss of signal with the command module. Also, we did not have the detonation of the seismic charge. We have about 2 minutes of tape of conversation with the crew before loss of signal. We'll play that back at this time, and, of course, we'll interrupt if we should get the firing of the grenade.

CAPCOM America, Houston. We're starting to get to the margin of our signal strength to get the data back. We want you to improve that by turning S-band mode, S-band normal mode voice switch to (garble) for about 5 minutes.

SC Say again.

CAPCOM Okay, Jack. We'd like you to turn the S-band normal mode voice switch to "Off Center" for about 5 minutes to improve our signal margin as you approach the terminus -- the LOS here.

SC Okay, "Off Center" for 5 minutes.

CAPCOM America, Houston. Don't bother to answer, but we'd like H2 Tank 2 fans off. That's Hydrogen Tank 2, fans off.

CAPCOM America, Houston. We'd like OMNI Bravo.

CAPCOM America, Houston, you can turn the voice back on now. Have about a minute and a half to LOS for a final goodbye.

SC Okay, this is America with --

PAO This is Apollo Control. We've just had a report from ALSEP that one of the bombs went off. We didn't see it on television, but we are beginning to see some seismic activity and we'll switch now on our television monitor to the seismic tracing, let you -- let you look at that.

PAO No one here in the Control Center observed on the television the detonation of that charge. However, we are planning to replay the tape from that time and see if a close look at the tape shows any -- any activity that we can see on the television camera.

PAO This is Apollo Control. It's going to take several minutes before we're ready to rerun the video tape of that time segment when the explosive charge detonated. In the meantime, we'll continue with our tape playback leading up to loss of signal with America on the 63rd revolution.

SC Okay, this is America with a goodbye for this pass.

CAPCOM Okay, I guess the real reason for having you turn the voice switch off there so the secretaries that are transcribing the air-to-ground here can catch up with Jack.

SC Ha, ha. I don't believe it. Yes, I do. Okay, that's all you ever hear from me again.

APOLLO 17 MISSION COMMENTARY 12/15/72 CST 17:32 GET 212:38 MC830/2

PAO That brings us up to date now with all of the air-to-ground that we've received from the crew up through loss of signal. We'll be reacquiring Apollo 17 in about 36 minutes.

PAO This is Apollo Control. The time at which we copied the firing of that first explosive charge was a ground elapsed time of 212 hours 39 minutes 44 seconds, which translates to 6:32:45 Central Standard Time, or rather 5:32:45 Central Standard Time. And, we should be ready shortly to rerun the video tape from that segment of the television. And, again looking very closely to see if the charge explosion is visible on the TV. The charge was placed about 1.1 kilometers from the lunar rover, and it was the 1-pound charge.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/15/72 CST 17:42 GET 212:49 831/1

PAO This is Apollo control at 212 hours
56 minutes. We've had some unexpected activity on the lunar
seismic experiment. And the ALSEP controller reports that
there is a lot of activity in the ALSEP room looking at the
very active seismic tracings that we are getting right now.
Some feeling that this may, in fact, represent the detonation
of that grenade rather than the previous signal that we re-
corded. If in fact that is the case we missed it on the
television because the television camera was pointed at another
area at the time that activity began. And, as soon as we
have a further report from ALSEP we'll pass that along to
you.

END OF TAPE

PAC This is Apollo Control we've had no further word from the ALSEP Control area as to which of the 2 seismic events we registered at the Apollo 17 site represents the firing of the first charge. However, it is noted that the second event came much closer to the anominal charge firing time.

PAC This is Apollo Control, we've concluded right here in the Control Center that the second seismic event, registered on the Lunar Seismic Profiling Experiment, was in fact the one pound explosive charge going off. Tthat occurred, at 212 hours 55 minutes 35 seconds, which was about 4-1/2 minutes later than the nominal or T-0 time. There will be a second charge fired. It is scheduled for 215 hours 27 minutes, that will be a 1/2-pound charge that is located 6/10 of a kilometer from the Lunar Roving Vehicle. We're now some 14 minutes from reacquiring Apollo 17 in its 64th revolution of the Moon. This is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo control at 213 hours 20 minutes. We're standing by now to reacquire Apollo 17 in its 64th revolution of the Moon. And we expect this at least from the crew work point of view to be a relatively quiet period. During this revolution they are scheduled to begin their eat period. And they will be operating some of the scientific instruments in the scientific instrument module bay the SIM bay. But, relatively little scheduled in the flight plan during this period of time. We show the spacecraft in an orbit of 65.3 nautical miles at its high point, and a low point or pericyynthion of 62.4 nautical miles. And, we should have acquisition of signal any second now.

PAO And we've had acquisition of signal.
And, it will take a second before we get good solid lock up.

SC Yes.

SC Hey Ron do you want me?

SC That's right there's a lot of those with the platform have got to be a lava type thing down there.

PAO And we've got a good solid signal now from the spacecraft - good data. Hearing Ron Evans in the background. Ron apparently has his mike in the so called VOX mode where it's triggered by a voice.

SC Houston, America.

CAPCOM Roger America hello once again. You've got about 1 minute to T stop.

SC Okay, we're right with you Gordie.

SC Okay. T stop is it - 24 20. Stand by, okay.

SC Okay, we're coming up on 24 20. The visual of Tsiolkovsky is hopefully pretty much recorded on the recorder.

CAPCOM Roger.

SC 18, 19 mark it - stand by. (Garble)
stand by. I guess the somewhat - very small summary anyhow of the visual of Tsiolkovsky concentrating primarily on the flow from the northeast corner. To me that particular piece that's fallen down in the crater there and it's on one of the pictures Tsiolkovsky four or five. The piece that is down in the crater is on the right hand side of the page. And, that portion you know is somewhat of a molten state. It looks like it is a land slide that has slid down the wall of the crater and detached from the - rather molten state of material rough looking material that's on the rim of the crater Tsiolkovsky.

CAPCOM Roger Ron.

SC There seems to be high lava marks around the western and northern sides of the central peak. For some

SC reason it's not evident or visible on the south side of the central peak.

CAPCOM Okay.

SC Also, there seems to be the high lava marks along the raised portion of the floor and the contact between the dark material on the floor and the lighter oh rough looking just before - on the northern side of the crater. In the first observation of the mass of material that goes out into the crater Farame. It looks like there is a whole bunch of craters in there that have essentially rimless craters. However, on close examination with the bionocs I couldn't see any that didn't have at least a slight indication of a rim. The rims that were on them were essentially very subdued. They extended out to about oh a half a crater diameter and these are on the craters in the 500 to 1000 meter size. I didn't get a chance to look at them looking straight down the craters to see if there was any depressions or any domes or any type of structure in the bottom of craters. I get the impression that they're primarily all look just of cones with no flat bottoms at all. And I'll look again at those things when we go by the next time. The flow that goes down into Waterman - if we look at the pictures Tsiolkovsky five of five the shadow is about the same area on this one as it is on that one - I didn't take a chance to look at that until I got to the west of it. So I'll have to look when I'm passing it from the north side of Tsiolkovsky looking south to see what's down in the shadow area there. When your on the west looking back across it you can't see into the shadow. But the material that's in the floor of the crater Waterman is the same type of material that the little flow on the northeast corner has broken off and slid down into its own little crater.

CAPCOM Okay roger that.

SC So I guess what I'm saying is that essentially whatever molten material that's up around on the rim of the crater Tsiolkovsky has been - well I want to say extruded - not extruded but pushed out I guess away from the crater and has been in a semiliquid or semimolten state in its period of deposition - -

END OF TAPE

SC I'll reserve judgment on some of the flat-floored, flat mare-filled depressions that are around the crater until I get a change to look at those the next time around.

CAPCOM Okay.

SC Say, Gordie, something that struck me, something maybe everyone else has thought about, but I hadn't before. At the southeast corner of Smythii, there was a relatively large -- several large somewhat subdued craters but with relatively steep sides to them, and next to this one was a very small, white, bright halo crater. And, I watched the rays of this crater, and the southeastern rays draped over the slopes of this much larger subdued crater, draped over the walls. All the way down onto the floor. And, as they draped over the walls, they obviously gave me a very good albedo change from the darker wall to the very much lighter colored. But, as they hit the floor of the crater, they form patterns that are not only -- not unlike, but actually very, very similar to the light-mantled area that we have been referring to as a possible slide, back at Taurus-Littrow. The patterns as they drape down the inner slopes of the crater, and onto the floor, I would be willing to bet if we went down there we'd probably find the same type of things we found at Taurus-Littrow. By that, I mean albedo changes that we can see here versus to what we can see down there.

CAPCOM Roger, very interesting.

SC I looked for these type of -- looked for these ray patterns where the rays just went out on a more horizontal plane, and you can -- you can find them if you look hard, but as they drape over the slope and onto the more level floor, they're very obviously alike.

CAPCOM Roger.

SC Hey, Houston.

CAPCOM Okay.

SC That crater, if you look at Smythii one of one, and the craters right above the Rev 62 there, you can see a bright spot on the northwest portion over there. And that's the breech zone of that particular crater. The thing that's intriguing about that to me is that if you look at the inner ring, it's a gradual slope from the center -- the center of the crater is lower than the secondary, the secondary ring around the thing. And, while the center of the crater is low, you have a gradual --

CAPCOM Ron, let me interrupt here. Say the name of the crater you're looking at again at Smythii.

SC Okay, it's Smythii. And, Mare Smythii, one of one, that -- that picture --

CAPCOM Roger, I --

SC And, right about where it says Rev 62. Okay?

CAPCOM Okay, gotcha.

SC Now, there's two -- there are two rings in that picture. Okay, and the inner ring, the central portion of that thing is lower and slopes outward, radially outward to the first ring. And, then it drops off, in other words, it's a gradual slope, maybe oh, somewhere in the 15-20 degrees slope upward to the first ring. Then it's a steep slope on the outside of the ring, at about oh, 45 degrees, dropping down into the annulus.

CAPCOM Okay.

SC Have color? With 250 lens. Yeah, all along. I just took it today, two of them, three of them. Yeah. Yeah. Yeah. I took three of them the last rev.

SC Gordie, this is the LMP. While we're waiting for the site to come up again, which seems to interest us every time we go over it, I think we sort of came to a general concensus on the problem of the smaller cone-shaped craters on the far side that have the little pool-like concentrations of material in the bottom. If you look at the breccias of those craters, the -- that seems to be contiguous with the streaks of very dark material that cover the walls and the rim of the fresh cone-shaped craters. As a crater gets older, that material -- that distinction becomes less obvious; however, the pool remains, and all you lose is the dark streaks on the rim and on the walls of the crater. I think we sort of feel -- suspect that that pool in the bottom of the fresh craters is just the concentrated impact melt that -- some of which is -- stayed there during the impact and other which drained back --

SC That ought (garble)

SC -- that drained back after the impact from the -- drained from the walls, and then, with time, that pool may be subdued some. The structures in it, the little swirls and little domes in that pool are subdued probably not only by the impact but by debris, slides and avalanches off the walls of the crater.

CAPCOM Okay, Jack.

SC It's getting to be a very consistent pattern when you start piecing several of them together.

CAPCOM Roger.

SC That black streaking on the walls and the blankets, Ron may have already told you, but it is characteristic of only the very freshest of those cone-shaped craters, and -- or pool craters, whichever you want to call them. It seems to be very logical that it just represents a thin veneer on the rim and the walls of the impact-generated glass, and it's darkest presumably where it's quenched, and the pool itself is somewhat lighter grey than the black streaks and mantles.

CAPCOM Roger.

END OF TAPE

SC Yeah, Jack, I get the impression
that these bright ones, see the bright one right down there in
front of us there, if you look at those with the binocs or
with the - I get the impression of a dark greenish black or
blackish green. In other words I get a green -

SC Green casting

SC Yeah, green cast to the rock. To the
big blocks you know that are laying around there - around the crater
and also the ones that are down in the bottom.

SC Right

SC That greenish cast to 'em.

SC Yeah, it is, isn't it. I can see that
with the naked eye. That's a bright one

SC I say, where is the crater though?

SC Oh, that's the Yerkes and -

SC Okay.

SC Hey, Gordy, we got another orange-red
crater. And we'll spot it. I think everybody agreed. And
this one very clearly looks like an impact crater that has
it's - let's see we decided you're looking north

SC Yeah.

CAPCOM Roger.

SC It's north - ah - east and west quadrants

SC Ah - (garbled) you describe it. It's
Yerkes and maybe 28 -

CAPCOM Hey, you got the T start time coming
up very shortly. About 10 seconds.

SC Okay

SC Quit interrupting.

SC Okay, we'll get it.

SC What time is it?

SC We'll hack it up here Gordy.

SC VERB 41 (garbled)

CAPCOM Thanks.

SC Okay.

SC (garbled) is operating.

CAPCOM That was close.

SC That was a very good call. No sweat.

SC Say get (garbled) map of -

SC Any rate in the northeast and west quadrants
of that little crater and we'll spot it for you on the map is
a very clearly an orange pattern - an orange color to the
ejecta. The other quadrant is a lighter color light gray.

CAPCOM Okay.

SC If I had a map. What did I do with my
map? I got a picture of that I think.

SC Right here.

SC No, go ahead.

SC I can't see the landing site anyhow, I don't think.

SC Gordy, my impression from Shorty the other day and also from seeing these craters that seem to have orange - that are around them, that look very much like impact craters from orbit at any rate. It may be that the - if that is an alteration phenomenon, that it's being localized around the structure created by the impact. But in this latter case it looks like the impact itself penetrated into a zone of that color.

CAPCOM

Okay, Jack.

SC

(laughter) Yep.

SC

Are we going to use your -

SC

Here, take a look at it.

SC

Doesn't show up that way today.

SC

Here. The color -

SC

Oh, oh, that's the spot.

SC

Yeah.

SC

Can't see it any more.

END OF TAPE

AMERICA Yes. That's a good view over there.

AMERICA They're between Tack A and Melanes, aren't they?

AMERICA Yes. I see them down there. Okay.

AMERICA They're little bitty one. They're about a little bit bigger than Shorty.

AMERICA Yes. Those are the ones that I called the other day. It was a very, very light tan. I guess you can put an orange tint to them.

AMERICA Gordy to put orange in to perspective, at least as far as the LMP guys are concerned from orbit, I would say that it's a orange gray, it's still a gray, with an orange hue to it. And when I use any blue or tan or anything it's a hue on gray, and I'll usually try to say gray in there, but to say something's orange, I think would be misleading. It's really an orange gray, but it's clearly a distinct hue.

CAPCOM Okay. Kind of like dirty beach sand, with a little orange in it, huh?

AMERICA Well, we can't use that term any more. That's copyrighted.

CAPCOM Roger.

AMERICA Yes. That's right. There is. That's the one. That's the area where I was trying to talk about. That's just north of, oh that's the (garble). No, it's a couch, just yes, northwest of (garble) crater. Yes. I didn't doubt it. I didn't talk about that thing. That's a, I was talking about the little orange crater. Now you can see all the colors down in the shadows itself.

AMERICA Hey, Ron. We'll spot this one on the map, too, Gordy. But there's a large gouge just south of the (garble, garble) ridge. The gouge, it's a rimless depression, and streaming down from the upper portion of that depression are not only our (garble), the orange grays, but some would be a red brown gray. Very, very clear coloration in this light, in, I think, my goodness, there's another crater we'll have to look at.

AMERICA Yes. There's a whole bunch of them down there.

AMERICA There's something in the wall of it in that area. Yes, it's starting, man, we're seeing an orange Moon now. Now this whole Dark Mantle in here around (garble) there're scattered craters with variety of orange to red brown hues and they all, except for that large rimless depression, looked, looked as if was exposing some layers, which were streaming those color, that color debris down it's walls. All the other craters seem to be small impacts, that apparently

AMERICA are penetrating just far enough into the Dark Mantle material to tap this zone of orange to red brown material.

AMERICA And just north of that elongate depression there is another circular crater, and it also is penetrating down through this mantle of stuff, and it has the reds and the browns and oranges dipping down it too. Hey, Gordy, just so you're aware we're not sort of just leaning and getting color blind up here, I tell you last one Jack was talking about was not even subtle. It's entire ray pattern was this same (garble) material and definite contact between it and the dark material around it and it had that orange brown hue to without any question at all.

CAPCOM Okay. Very interesting.

AMERICA It really is, you know I saw that dirt day before yesterday at Littrow, but, and I really haven't seen too much from orbit that I'd call really very distinct in color, until this one. But boy there's no question about this one.

CAPCOM Roger.

AMERICA And we will pick up the lunar sounder at 59:54.

CAPCOM Okay, I'll try to watch it and give you a little more warning too.

END OF TAPE

SC No, I want to get - I think it's right
in that
SC Where are you at, let me see.
SC No, here's the Selvikous Galois. No, you're up
too far, you're up too far. Closer to Selvikious Galois. Right
in that ridge Mesa, right in there on a red line.
SC And, we'll get a picture of it anyway.
SC Yeah.
SC (garble), yeah.
SC (Humming)
SC Okay, sorry, Houston. We turned that
one off at a minute off. (Laughter)
CAPCOM Okay.
SC We'll pick up an extra minute on the
next one.
CAPCOM Roger.
SC (Humming and Laughter)
SC Okay, Houston. Recorder's going OFF.
CAPCOM Okay.
SC Hey, Gordo. I better make this note now.
What Jack and Ron were talking about apparently was A elong-
gated depression. I was talking about in the same area, and
I'm trying to mark it approximately on the chart. But it
was a classic small bright haloed crater. The classic with
a classic ejecta and everything. Except it was this orange
hued-crater. It was not bright white. But it was very classic.
And, as I said earlier, not subtle at all.
CAPCOM Roger, Gene.
CAPCOM America, Houston. I have a TEI for
REV 72 pad, no hurry, maybe you want to wait until sunset.
SC Yeah, we'll wait for sunset, okay.
CAPCOM Okay.
SC Houston, 160 and 162, the MAG Oscar, Oscar.
We're taking from the north, viewing the Central peaks of
Copernicus.
CAPCOM Okay, Ron.
SC It's a long ways away, I don't know if
it'll show up or not. It might.

END OF TAPE

SC Houston this is America.
CAPCOM Go ahead.
SC Okay Gordo I'm looking ahead - trying to stay ahead and see what's happening today and tomorrow in the flight plan. And although this has come up in the past we haven't said anything about it. You know Ron put his biomed harness on a couple of hours ago and he's going to end up wearing it a total of six hours then when we make a change over again and I put it on and for a twelve hour period and then we change again. And, one of the problems up here is putting these things on and you'd like not to leave them on too long but once you get them on you like to make use of them, and it's a problem, it's time consuming I'd like you to consider down there letting Ron wear wear those until tomorrow morning and let me change over then. And one EVA time comms rule take special consideration to whatever requirements there are.

CAPCOM Hey, you just got a thumbs up on that from the surgeon.
SC Okay, very good thank you.
SC Okay, Houston took whatever the three were before 39 on mag yankee yankee of Euler Tobiousmyer terminator stuff.

CAPCOM Okay, Ron and for Jack the surgeon says he's getting occasional erratic trace from Jack's biomed he would be happy if Jack wants to take it clear off.
SC Gordie, I don't know how to tell you this but I haven't had my biomed on for about 6 hours.
CAPCOM Okay.
SC As a matter of fact I haven't even had the sensors on.

CAPCOM We must be copying the heart beat of the America or something.
SC How does it look maybe we ought to use it instead of mine.
CAPCOM America's ticker is doing fine - along with everything else.
SC Okay, Houston, this is America I've got a flight plan change for you if your ready to copy.
CAPCOM Okay, ready to copy.
SC Okay, if you'll turn to page 3-26 at 217:52.
CAPCOM Okay, go ahead.
SC You can delete both those steps.
CAPCOM Okay, I've got that.
SC Okay, if you'll turn to 230:40 you can cross out LMP and put CDR.

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CAPCOM Okay, we've got that.
SC Okay, if you'll turn to 230:29.
CAPCOM Okay.
SC You can change the first line cross out
LMP and put CDR, and on the second line you can cross out
CDR and put CMP.
CAPCOM Okay, I must be on the wrong page - did
you say 230:29. Must be 231:29. Okay got you.
SC 231:29 cross out LMP and put CDR on the
first line. Cross out CDR and put CMP.
CAPCOM Alright.
SC Okay, and we'll further update you as
the mission progresses. I know your pretty busy and we'll
hold any flight plan updates down to you to a minimum from
up here.
CAPCOM Okay.

END OF TAPE

SC Okay, Gordy. You want to give me TEI pad?

CAPCOM There's nothing I'd rather do. Ready to copy?

SC Go ahead.

CAPCOM Okay. It's TEI for 72, SPS/G&N. 36477, plus 061 plus 083. NOUN 33 is 230 42 5917. NOUN 81 plus 28874, minus 03394 minus 00503 179 095 356 rest of the pads NA. GDC stars Sirius and Rigel 136 160 034, ullage is 4 jets 12 seconds. Remarks assumes ascent RESFMMAT.

Over.

SC Okay, TEI, 72, SPS/G&N. 36477 plus 061 plus 083. 230 42 59 17. plus 28874 minus 03394 minus 00503 179 095 356, Sirius and Rigel 136 160 034 ullage is 4 jets for 12 seconds, and it assumes an ascent REFSMMAT. Over.

CAPCOM Okay, that's a good readback. Say, we have a little summary of both the surface and the orbital scientific equipments working, probably about 5 minutes worth. If there's some handy time, I'll be glad to read it to you.

SC Right now, Gordy. We'd love to hear it.

CAPCOM Okay, let me start with the America's gear there. The - On the UV spectrometer well, I'd say having to do with UV. Back during REV 38, they sent an Arrow bee sounding rocket from White Sands, up and it carried a UV spectrometer above the atmosphere, successfully acquired solar UV calibration data. Far side terminator shows that there is an hydrogen atmosphere but it is much less than had been predicted. The PI is very happy with the mode 4 maneuver. On the IR scanning radiometer, it's still performing beautifully and the PI is getting lots of high-quality data and I understand there is ecstatic about it. On REV 33 the crater Kepler C showed up as a 132 degree kelvin anomaly when a 94-degree kelvin background. After 11.6 days of lunar night. The crater Reiner was a similar anomaly on that revolution. In low orbit on REV 9 Kepler A showed a broad hot spot corresponding to its ejecta blanket with a sharp spike corresponding to the crater in the center. One cold spot anomaly seems to correspond to a cinder cone-like feature in Mare Orientale near the crater Homan. On the lunar sounder. Telemetry monitoring of the sounders average reflected power indicates that the Mare and Highlands exhibit markedly different reflectivity both HF and VHF. The data is consistent with distinct layerings in the Mare, as would be expected were the Mare flooded by successive layers of Mare. Although, they say other explanations are possible. They don't see that layering indication in the Highlands. Predicted topographic signatures over features such as craters and

CAPCOM mare ridges have been confirmed as invisible. Of course, as you know, until they get the film back they don't have - they can't really reach any definite conclusions. On the cameras. The cameras, both cameras and the laser altimeter all appear to be performing very well and everybody's especially happy with the solid laser altimeter performance. Okay, that kind of sums up SIM BAY. Do you have any questions that I could chase down or shall I go on with service stuff?

SC No, why don't you press on.

SC That sounds good Gordo, press on.

CAPCOM Okay, on the surface, the Heat-Flow.

These are little short summaries each written by the PIs or COIs on each experiment. Mark reports that the entire Heat-Flow System is working perfectly. Probes have cooled down to a temperature of minus 16 degrees centigrade at a depth of 2.3 meters. And are nearly at their final temperature. For a comparison, Hadley Rille is on the minus 20 degree centigrade at 1.5 meters depth, to refresh your memory was minus 16 at 2.3. Both probes show an increase of temperature with depth and it is clear that we will get a valid Heat-Flow measurement. The LEAM is functioning properly responding to calibration and sensors show a low noise figure. The LEAM will be off until lunar afternoon and on with sensors covered until after sunset. Otto Berg asked that you accept his thanks and appreciation. On the LSG, the sensor beam cannot be nulled at this time in spite of Jack's efforts. We are still studying the problem and hope to find a workaround. In any case, the instrument does function to some extent as a vertical seismometer and may be useful in a search for a gravitational radiation from pulsars. The LSPE is fully operational LMS and clearly recorded on all four geophones and apparent seismic velocity measured across the geophone array was 110 meters per second. Regolith velocity was very close to that measure at the Apollo 16 site. The LM impact was clearly recorded on the geophones and the estimated distance was 10 kilometers away in the South Massif, actually very close to the targeted point. Although I guess you've discussed this; we didn't see it on the video. The first charge went off while you were on the backside last REV and it's very apparent on the traces which I'm monitoring right now. I think the next one's due sometime within the next 2 hours. Okay, the lunar mass spectrometer - the low voltage circuits of the LMS have been operated briefly. All monitors indicate the proper performance of the instruments but application of high voltages will await lunar

sunset when both the analyzer and the site have had time to outgas. The temperature of the radiator plate is slightly above normal but not so high to be even important. That was from Dick Hodges. Okay, here's a little summary from Dave Strangway on the SEP. He starts out by saying, water, water everywhere and plenty to be found because you didn't get behind the timeline. The SEP transmitter was confirmed to be working well at the correct power level using the lunar sounder. The receiver heated well above predictions during the whole mission as I'm sure you are aware, but the two prime data legs were operated within the temperature limits of the recorder and we have no reason to doubt that we got good data. There is also a good chance that leg from station 4 to the LM was within the temperature limits. Your procedures were performed excellently and we look forward to processing the DSEA tape. Okay, now to - let's see, we got the TGE which is considered a spectacular success. The Earth-Moon gravity transfer indicates a value of - we'll read the numbers in milligauss - at the Taurus-Littrow base - but the value will be used to obtain a revised value for the lunar radius at this landing site. Gravity measurement made during the three EVAs showed a large negative anomaly of about minus 38 milligauss at the base of the South Massif and a similar negative anomaly of about a minus 30 at the base of the North Massif. Preliminary conclusions of the traverse gravimeter mea - the TGE measurements indicate that the material under the valley floor of Taurus-Littrow is much denser than that of the North and South Massif. Gravity values will support the hypothesis that the valley subfloor consists of dense basaltic rock perhaps as much as three or four kilometers thickness. The extra measurements between station 2 and 3 will be of great help in determining the nature of the boundaries of this basaltic layer and the varied extension of the massif. The cosmic ray detector, actually you know as much as we do about the data return from it, of course, but the - we did recover it early in EVA-3 as you remember, and that was due to minor increase in low energy solar protons and heavier particles - we checked it here - and the reduced exposure will not offset the scientific results. The neutron probe was exposed to tge surface for 49 hours. PI estimates that the distance from the RTG to the probe is 40 meters which will mean that the background count will be low and he thanks you kindly for those few extra steps.

END OF TAPE

CAPCOM And the last one was to be summarized was the field geology and they asked for a very short summary, so Waltberger came through with 3 typewritten pages. So, we're just going to skip the whole thing, except the last line, which was to say that you guys did an outstanding job. Over.

AMERICA Thank you, Gordy. We're just pleased that so many things are working well, and happy that the PI's are satisfied. That was our objective and we came up here to meet it, and those things that are done, I hope we met it well, and we've got a few more things to do yet.

CAPCOM Well, I can assure you you're not the only ones that are pleased.

AMERICA Gordy, you know it's satisfying to have put that much time in and come out with some meaningful results. That makes us all feel good. Have you been able, or did you see that first charge on the video.

CAPCOM I forgot to mention that. No. We sure didn't see a thing. We had the camera aimed over there, but it was almost a kilometer away. That was a one pound charge and we played it back several times, but nobody saw a hint of anything.

AMERICA Okay. If you guys you got a few more going off here in short order don't you.

CAPCOM That's affirmative. I don't think we're up to the next one yet, but we'll keep you posted on whether we see anything, or how they're doing.

AMERICA I might also say, we appreciate the time and effort the PI's put in with their experiments and with us also.

CAPCOM Okay. I'll make sure that gets to the back room.

AMERICA Gordy, this is Jack. What did they see over next to the Sculptured Hills on the gravimeter?

CAPCOM Well let's see, Jack. They kind of - let me turn back here. They actually reported when they mentioned the negative anomaly of minus 30 milligals at the base of the North Massif. They said Stations 6 and 8 parenthetically there so evidently they're including the whole area there as the negative anomaly. I'll try get a more amplified answer to your question.

AMERICA Now, could you see if you can verify with them that they were unable to or there was no distinction between the measurements in the Sculptured Hills and the North Massif.

CAPCOM Yes. I'll work on that.

AMERICA Or better yet, what was the distinction between the Sculptured Hills and the subfloor area?

CAPCOM Okay.

CAPCOM You may have to wait til next time around for your answer.

AMERICA Oh, there's no hurry. You can wait til tomorrow or even a week if you want to. I was just thinking about that problem.

CAPCOM Okay.

AMERICA By the way, Gordy, you might tell Bob Walker, if he's around, that the cosmic ray as far as I know was untouched by human hand at least on the Moon. And it looked very, very clean when I put it back together.

CAPCOM Okay, Jack. We'll pass that along.

CAPCOM America, Houston. One more question from the surgeon on this mysterious trace on the LMP's biomed. Do you have anything plugged in to the, is the biomed still plugged in and laying over on Jack's umbilical or is there, is there anything plugged in to, to Jack's that could explain the funny trace here. It's kind of a sporadic looking, looks like somebody with a heart in a pretty bad shape. Over.

AMERICA Gordy, my heart has always been in bad shape for other reasons than the one the surgeon's thinking about. It turns out that I am still plugged together. I just don't have the sensors on. I will remedy that situation, so he doesn't have to worry anymore.

CAPCOM Okay, that solves the mystery. Thank you.

CAPCOM Say, America. About 30 seconds to LOS. See you next time.

AMERICA Okay, Gordy. Thank you very much and we'll see you coming around.

PAO This is Apollo Control at 214 hours 36 minutes and we've had loss of signal now with America on the 64th revolution of the Moon. Be reacquiring in a little less than 45 minutes. And coming up at about 215 hours 27 minutes, a little less than 1 hour from now, we're scheduled to have the second detonation of an explosive charge on the lunar surface as part of the lunar seismic profiling experiment. This charge will be a one-half pound charge located about six tenths of a kilometer from the Lunar Roving Vehicle. The summary of science information read up to the crew by our CAPCOM Gordon Fullerton will be available in the News Center. We hope to get copies of the information read up to the crew to the News Center and reproduced and available. It will of course also be available on the transcript somewhat later. At 214 hours 37 minutes, this is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control at 214 hours 56 minutes. In about one minute we'll be commanding the television on the lunar roving vehicle ON and we'll have it positioned to look for this second explosive charge which is going to be fired at about 215 hours and 27 minutes. This charge is part of the lunar seismic profiling experiment. It is a one-half pound charge of explosives located about six-tenths of a kilometer southeast of the lunar roving vehicle. And we've got black and white TV now from lunar surface and we'll have that through the converter and up on the area where that charge is located. And the instrumentation communications engineer will be putting that camera in the proper position.

PAO We're about 27 minutes away from the predicted time of detonation. However, we are within the window during which the charge could explode. As we mentioned on the previous charge, this window is brought about by the fact that the timer is a mechanical timer, the firing charges set continuously during the window and as the timer moves across the face of the firing pin, the firing charge going in - the firing command going in continuously fires the charge as the window moves across the pin.

PAO And we believe the television camera is now centered on the area where this charge is located. Hopefully the charge is right in the middle of the television screen.

END OF TAPE

PAO This is Apollo Control now about 1 minute 20 seconds away from reacquiring Apollo 17. It will be on the 65th revolution and we're looking through the lunar rover television camera at the spot on the Moon where we believe the second of two seismic charges to be detonated, is located. We do have a problem with the TV camera in that it appears to be heating up close to the acceptable limit and it could become necessary to shut the camera down prior to the time we have the detonation. This decision will be based in part on what sort of priorities the scientists have for other things they would like to view with the camera in relation to the detonation of this charge. And the instrumentation communications engineer is keeping a close eye on those temperature readings reports that the temperature has apparently begun to stabilize and to maybe even move down a bit, so we maybe out of the woods on that score.

PAO And we have acquisition of signal. Should get a good stable lock on shortly which will decrease the noise on the air-to-ground circuit.

AMERICA Houston, America.

CAPCOM Hello, America. Here at Houston.

AMERICA Houston, America.

CAPCOM Yeah, America, a lot clearer.

AMERICA Okay, Houston, America here. The mapper when we took the image motion from OFF to OFF and then the mapping camera switch from OFF to ON-OFF-ON I think. Maybe it was stamped by a 0, but anyhow, as soon as we went to ON the barber pole on the (garbled) back, went back to standby at just before AOS or just about AOS there, it (garbled) 20 about 15 20. Then we got a gray on the talk-back with the mapping camera standby, then we went back to the cycling and it worked okay, so it's working now and it's ON. What a thing. It didn't start working until about 20.

CAPCOM Okay, Ron, we got that.

AMERICA Must have been too cold, huh?

CAPCOM We'll look at it now.

CAPCOM America, would you select wide on the high gain and then narrow?

AMERICA Don't seem to make any difference. I'll try a react position again manual. And wide.

AMERICA AUTO narrow doesn't seem to be working very good.

CAPCOM Let's try react, Ron. You're in a skim reflection zone there is probably the problem.

END OF TAPE

PAO And, we just had a call from our Instrumentation Communications Engineer that he saw the charge blow down in the lower left corner of the television screen, and simultaneous with that, we're getting very active response from the seismic experiment, the tracing pens are very -- very active, almost going wild at this point.

PAO And, the scientists in the back room here also confirm having seen the charge explode. We'll be re-rolling -- rewinding the tapes and playing back the video tape of the detonation.

SC Gordie, this is the LMP. How do you read?

CAPCOM Jack, you're loud and clear.

SC Okay, add to that little discussion of the pool-bottomed cone-shaped craters that I had, I think, the last rev, that the one place there seems to be some variety in the freshness of those kinds of craters is in Mare Smythii where -- the ejecta blanket of many of those kind of craters has some small dark halo craters on them -- have small dark halo craters on them. Three or four or half a dozen per crater, on occasion. But, that seems to be something that we -- I've only seen, so far, in the Mare Smythii region.

CAPCOM Roger.

SC They're superimposed on the bright ray or ejecta blanket and are ejecta blanket systems of the -- those fresh cone craters.

CAPCOM Okay.

END OF TAPE

CAPCOM America, Houston. I got some words for you to request for a little visual observation at the landing site area, having to do with orange material. If you're ready for about a 5 minute briefing, I'd like to give it to you so you can get set up.

AMERICA Okay, go ahead, Gordy.

CAPCOM Okay, what we want to do is see if, this was triggered off by your observation of orange material last REV I guess, and possibly earlier. But the idea here is to look for some craters that we've identified on photographs that are in similar geologic setting to Shorty Crater and see if we can see orange material around them. We're trying to determine if the orange material at Shorty was a one time special occasion or whether possibly its common to the area and just never been noticed before. We think you'll be able to determine this visually, better than any other way. So, if you can get out the orbit, the orbit charts, the orbit photographs, let's see, the lunar landmark maps for the CSM and turn to the landing site number 2 of 4 picture. Let me know when you've got that, and I'll show you where we think a likely point is to see craters that are similar setting to Shorty, to look for orange material.

AMERICA Okay, Gordy, we'll do that. I made a couple passes with the binoculars over the Dark Mantle around Littrow already, and have seen nothing comparable with what's around Sovicius, but let's have the examples, and we'll make a special effort on it.

CAPCOM Okay, have you got the site photo number 204?

AMERICA Stand by just 1.

AMERICA Which one is that, Gordo, 2 of 4.

CAPCOM No. Number two of 4 of the site photos.

AMERICA Oh, 2 of 4, okay. Okay, we got her.

CAPCOM Okay, you can see the landing site there at about 4 o'clock, and the 7 kilometer crater in the, on the center line of the page, about a third of the way down from the top, the large bright crater there is Littrow B is the name of it.

AMERICA Got it.

CAPCOM And on the southern half of the ejecta blanket from that crater, there're several dark halo craters, which we think are in similar structure as Shorty. We think that would be a likely spot to look for orange material. There's a, Farouk has circled about 4 or 5, they show up say at 4 o'clock 7 o'clock, 8 o'clock, and 9 o'clock out about, from the center about a crater diameter, in other words, a crater radius, beyond the left, roughly. We suggest that you utilize the best window in your attitude which you should be maneuvering to now if you if I haven't completely interrupted the Flight Plan. Is, at that attitude window, let's see, 1 is the best and 4 should

CAPCOM point up that way also. We suggest you get somebody on the binoculars at 1 and use the same camera setup with the exception of using the 250 millimeter lens, if you can, that you're going to be setting up for as per the Flight Plan for the orbital science photos. If you can put the 250 on there, use KK as shown, and F8 1 250 as an infinity I'll repeat that when you get to it. For the pictures if you see anything. What we're looking for is orange material.

AMERICA Okay, Gordy. We're working on that now, and we'll get KK out.

CAPCOM Okay. We were thinking you might be able to get the guy on the camera in window 4 and the binoculars in window 1.

PAO This is Apollo Control. We're about ready to replay now the video tape showing that second seismic charge detonating. You'll see it down in the lower left corner of the screen. It'll appear as a bright flash, with little or no dust visible.

AMERICA I think maybe you're right about window 4 possibly being the photography window. If I can get oriented right. I thought you, oh. There you go. Yes. It's all set right here. And, Gordy, I'm going to try to also shoot if you'll let me 2 pictures on KK of that depression, colorful depression we saw near Sovicius Galois, if I can see it. Is that okay?

CAPCOM Okay, I'll give you a unilateral GO on those two frames and we suggest upu use 2 or 3 frames on this area we've been talking about also, in addition to the scheduled 28.

AMERICA Okay.

CAPCOM If we get short of film or something Farouk says the last part of this orbital science photos after you get to the end of the run change to 125th of a second, it's kind of marginal for photography anyway.

AMERICA Right. Okay, Gordy, you want the pictures whether we think we see orange or not, huh?

CAPCOM That's affirmative.

AMERICA That's very strange. May have to pass you the camera in a hurry, Gene. I'd love to. do that. You know, Gordy, the craters we're seeing around Sovicius that are orange or gray, orangish are very clearly orange, orangish gray and the whole, or at least most of the crater is that way. We looked at Shorty today and Ron said that even the little bit of orange that he saw the other day is now visible. And I have to agree with that. The amount of orange we saw on the surface certainly would not be comparable to what we're seeing around Sovicius Galois.

CAPCOM Roger.

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AMERICA And in a couple of quick scans of previous
REVS of the area, the Dark Mantle, near Littrow, I could not,
I did not notice any obvious orange gray craters.

CAPCOM Okay.

END OF TAPE

CAPCOM Just to make - to be sure we're clear on this. We suggest that area to look for them only as a likely spot. But any evidence of craters with orange material in the whole dark mantle area around Littrow and the edge of Tranquility there is worth noting and getting a picture of if you see it.

SC Okay.

SC I don't think there's anything there. Yes, I've got a few. Yes. Okay, 5.6 and a 250. No, I don't either. I don't see anything comparable at all. You know the ones that we've been seeing the - definite orange and the light tan stuff around are pure light ejecta blankets around them not dark.

SC Houston, I guess none of us see anything comparable to what is down by Scopacious. And no obvious color either.

CAPCOM Rog.

SC Well, their comparable to Shorty but their not comparable to the ones that we've been seeing the obvious orange.

SC The craters are comparable to Shorty as Ron points out, but the color is not there.

CAPCOM Okay. We'd like to give you a couple spacecraft chores like to terminate the charge on battery B and turn H2 tank 1 fans on.

SC Hand me the camera. H2 tank 1 fans going on and I'll get that charge in just a second.

CAPCOM Okay, and just a reminder to go back to f-4 at 250th when you get ready for the orbital science photos also the 80 millimeter lens if you happen to be (garbled) 250 on there.

SC We're getting a litter closer to the terminate change to 5.6, Jack. Oh, maybe not -

SC We're looking down zero phase.

SC That's right it's almost zero phase, okay.

END OF TAPE

PAO The crew is taking pictures of the landing site at this time.

SC Better I change to f.4.

SC Yeah, but you're going to look at the nadir, aren't you?

SC Yeah, that's right.

SC You sure we let the -- yeah, that's right, 8 second interferometer or for looking at the nadir with the 80-millimeter, right?

SC Yeah.

SC Okay. Let me take a look down at the -- that Mare floor and Dawes, no, that's -- that's not Dawes, that's Bessel.

SC Doesn't look like Dawes' dust. It's got a bunch of little depressions; they look like rimless pits in the bottom of it.

SC Bessel doesn't have any of those. It looks like a bunch of debris.

SC (Garble)

SC (Garble)

SC Yep, yep, I see it.

SC Yours is -- I see yours, Gene. It's on up there a little further, but all of these are in the -- this is not out on the Mare floor of Serenitatis. It's on the hills there Haenus Mountains. It's just to the west of the Sulpicius Galois Rille, and it's elongate feature that runs kind of north northwest by south southeast. Yeah. No, it's not from hard core at all. It's up there in the edge of the Haenus Mountains. But, that was the same type of material -- it has the same color difference as the material around the Tacquet Rilles back there. Yeah, see all those bright orange craters right in the -- in the Sulpicius Galois Rille, up at the north end of it? Jack calls them an orangeish-grey, I call them an orangeish-tan. No. No. Jack, did you get the pictures -- good picture --s because I can take it. See that one, oh yeah, see that one on the Mare?

SC Yeah.

SC There's my orange crater. I knew (garble).

SC Yeah, that's it. Yeah, I can, too.

SC Yeah, Gene, your's is out of the -- I got a picture of it.

SC Are you sure?

SC Yeah, yeah, I know. It's got a --

SC It's just inside (garble).

SC Just in the -- wait a minute. Okay, I've got one out in the Mare itself that's got a strep --

SC Domical Hills and I can't take it any (garble).
SC Yeah, when we get to -- when I see one out there, I'll get it.
SC Yeah, I better have because we're getting close to -- as a matter of fact, I need it just about now.
SC El Gordo, we're going -- we're going to get set up around orbital science, but that little classic crater -- I could see it again with the --
SC With the 250?
SC -- with the naked eye. I don't think it's the same one that Ron and Jack were talking about, but this is so classic; it's just out of the Mare into the foothills to the -- right along our orbital track.
SC And, we're starting with Mag 109 for the orbital science on kilo kilo, and I don't know what the number was before we started taking all our (laughter).
CAPCOM (Garble) we copy that 109 on a k -- on kk.
SC Okay.
SC (Garble)
SC What? Okay, there's the old Apennines. Where we heading for on this, Gordie? Can you give me a clue, as we go along? Well, yeah, Mare Imbrium is a big thing. Oh, the stupid thing doesn't work. I got that one. I got that one.
SC Ah, I think you're kidding.
SC Yeah, I did.
SC Gordie.
CAPCOM Go ahead.
SC This is Jack. My impression in that rimless V-shaped depression that had the striking talus on it that it also was a spotted, mottled rim area that has the orangeish-tan, or orangeish-grey color as the spot. And, it looked as if the in the first -- in this pass -- and, I'll try to verify it if we have another opportunity. It looked as if the more red-grey, red-brown-grey, if you will, material was lower in the section within the walls of the depression. This is a very steep-walled depression, by the way. It has talus streaming down the sides of it, and the coloration streams in the same direction. It looks as if there may be layers, or roughly, horizontal zones that are -- that have the colorations that we're seeing, which are forming the talus slopes down below there.
SC Very quick -- the window I changed to
2.8.
CAPCOM Okay, not till you get on up the line, Ron, to Lambert.
SC Oh, okay.
SC Lambert? Okay.
CAPCOM Ad, your pictures are pretty much right along the nadir.
SC Okay.

END OF TAPE

SC There, I got it okay, there's La Hire Rille coming up. Lambert's right over there coming up just to the south of - what is that? Maybe we can start with the LaHire rilles. There's one rille goes right through it almost, and another one - see, goes northeast southwest. Oh, I see, okay. Gordy, getting a good oblique view of Copernicus on this trip and some of the dark haloed craters that we mapped originally on the north portion of the ejecta blanket which were similar to Copernicus. They are very clearly darker haloed than the - or have darker blankets around them than ejecta blanket from Copernicus.

CAPCOM Roger, and Ron should be due to change to 2.8 about now.

SC And, this is a good view of the central peaks although from some distance, and, as Ron and I were discussing earlier, it's not at all clear that that in fact that dike does not come through as the - the so-called dike - as the - as the unit that is clearly defined. Yeah, I was looking at it through the binocs last time and I couldn't see anything that was really defined as coming on through there.

CAPCOM Okay.

SC There's still a very clear distinction between the dark floor material of Copernicus and the hummocky floor material - the dark smooth being in the north-west quadrant. You know, if Lambert is an impact crater, it's sure awful smooth ejecta around that thing. It only goes out about a half a crater in diameter, maybe a crater in diameter at some spots, at the most. But it's not rough. It's blocky looking, you know it's smooth - smooth undulating.

CAPCOM Ron, your next camera change is at Euler which you change to 125th of a second.

SC I think we just clicked. We did. You out of film? Yep. Want that other mag? Let's put oscar oscar in there and see if it will work. Here. Okay. Where's oscar oscar. We got a big oblique view of the Hortensius dome and with her nice little central pit craters. Did we hit the stick or something? Looks like a change in attitude, well, I'll be darned put oscar-oscar on there and I got but one picture. Yeah, it's empty. Yeah, that's probably right. It won't come out too good there, anyhow. Too close to the terminator for this kind of film.

CAPCOM Yeah, we agree with that, Ron. Farouk was mentioning that was kind of - beyond Euler was pretty marginal anyway.

SC Yeah. Gordo, that classic crater that I talked about last rev, I picked it up again this rev with the naked eye and I also looked at it with the binocs. If Ron was talking about the same crater, and I have my doubts, he got a picture of it he said. But, the interior - I won't say there's a change of blanket, it's just dark. I'd say it's probably about the size, putting it in the right perspective, of Shorty, or just a little bit bigger. The inside is dark. By that, I don't mean it's black or anything inside - I just can't really see inside of it - but the - it's a rust colored blanket that comes out and overlaps on the rims and

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then has the classic ejecta, and I'm going to take a shot at trying to get a picture of it next rev or sometime when we're in attitude cause it's too good to miss.

CAPCOM Okay. And, commander, if you can send one of your subordinates over there to terminate the battery charge, we'd appreciate it.

SC Okay, it's in worked.

END OF TAPE

SC Even BRAVO. One point coming up in just a little bit. (garbled) 1.25

SC Okay, Houston. Battery charge on V is terminated and we got 1.25 on 7 BRAVO.

CAPCOM Okay, thank you.

SC Here's November November, it may have 3 or 4 pictures left. It's on 160. Messed that one up.

SC We've got Papa Papa for opportunity.

SC Yeah.

SC Houston, you ready for laser altimeter ON?

CAPCOM Standby. America we're seeing some higher than normal temperatures on fuel cell One. We'd like you to go to panel 226 and check the fuel cell One pump circuit breaker and also the switch on panel 5. Over.

SC Well, don't ask me how it happened, but your switch on panel 5 is OFF. Going to AC-1.

CAPCOM Okay, I guess that's the best news we could have had on that. And we're ready for the laser altimeter, and get the attitude.

SC Okay, and A, Gordy - Gordy?

SC Here's one you can explain to me. When I turned that ON, well, I guess that - I got a sudden drop in H2 flow and then it went up overshoot a little and now it's steady. I suspect that's what you're E Com friend there will say should happen.

CAPCOM Yeah, that's great and we see indications that the pump started up.

SC Okay, that was a good call. I can't - how long have you noticed that, Gordy? Do you know?

CAPCOM Well, it's been about 3 minutes, Jack.

SC Okay, I guess I'm to blame then, don't know how it happened.

SC Hey, Houston, America. Do we have any more orbital science photos?

CAPCOM Standby.

SC I think that was it, but I'm not sure.

SC Okay, Houston. Laser altimeter is ON and image motion is barber pole plus 4.

CAPCOM Okay. Thank you.

PAO This is Apollo Control at 216 hours 15 minutes. A few minutes ago you heard Capcom Gordon Fullerton query the crew as to whether or not a switch might have been placed in the wrong position on one of the pumps circulating glycol, a coolant, to fuel cell No. 1. And Jack Schmitt looked at the panel, confirmed that a switch was in fact in the OFF position, turned it back on and everthing

was back to normal with no problem. By way of background the E Com, John Aaron, had noticed a slight increase in temperature on fuel cell One via the telemetry. After watching it for or 4 minutes he asked Capcom to check with the crew, see if the switch controlling the glycol pump was in the OFF position and as mentioned, Jack Schmitt confirmed that it was. This pump, as we say, circulates liquid glycol coolant through the fuel cells and cools it in much the same way that water flowing through radiators and around the engine of your automobile, cools the automobile engine. The most likely explanation for the switch being in the wrong position that we have here, appeared to be a more or less transitory phenomenon, was that it was dumped by one of the crewmen moving about the cabin in zero g. The fuel cell temperatures very quickly had dropped back to normal once the pump was turned on again. We have about 18 minutes remaining in this pass before we loose radio contact with Apollo 17. We are showing an orbit at this time with a high point or apocynthion of 65.2 nautical miles and a low point or paracynthion of 62.2. Among the other statistics the orbital rate of the CSM at this time is 36 477 pounds. And the orbital period just a tad under 2 hours, 1 hour 59 minutes 17 seconds.

END OF TAPE

CAPCOM Say Ron, this is Houston. And there's no more scheduled orbital science photos. We can't seem to run down Farouk to see if he has anything up his sleeves. There are a couple passes with black and white coming up, one next REV, and then a couple just prior to TEI.

AMERICA Okay, looks like what we got left here, as far as I can tell anyhow, just, we've got all of magazine Papa, Papa, and maybe 4 or 5 of them on November, November.

CAPCOM Okay, and we'll come back to you if there's anything we got in mind to schedule on on either of those.

AMERICA Okay, we want to save some for after TEI, too. Shooting back at the Moon.

CAPCOM Roger.

AMERICA Okay, Gordy, that's TEI 1 not TEI 2 he's talking about. Okay, I see what he said.

CAPCOM Rog. TEI period.

AMERICA That's right.

AMERICA These guys can call it what they like, but I know what it's going to be and when.

CAPCOM America, a little human interest stuff here. We just watched the second charge go off, not just watched, it's been about half hour ago or so. Second charge went off and we caught it just in the lower left corner of the TV view. It looked like a, to me it looked like a flashbulb went off, flashbulb laying on the ground went off, just a kind of a quick flash. No big shower of dirt or anything that I could tell.

AMERICA How far away do you expect that one was Gordy?

CAPCOM That one was 600 meters away. And it was a half pound charge.

AMERICA Yes you're still pretty far away over that. Yes you're still pretty far away over that terrain that those things are sitting in over there. You're going to probably see something when you look at those that spiked by the end of the SEP and back to the east there.

CAPCOM Rog.

AMERICA Houston, America.

CAPCOM Go ahead.

AMERICA Do you need the cryo stirred at all today?

CAPCOM Let me see here. Stand by. No. I guess you've been bouncing around there enough. We don't need to stir them.

AMERICA It won't hurt them will it?

CAPCOM No.

AMERICA Okay.

CAPCOM Showing about 115 beats per minute on the CMP.

APOLLO 17 MISSION COMMENTARY 12/15/72 GET 216:18 CST 21:11 MC849/2

PAO That call of a 115 beats refers to Ron Evan's
heart rate, the Command Module Pilot, exercising at this time.
CAPCOM America, we'll take AUTO on the high gain.
AMERICA Okay, you've got AUTO.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/15/72 CST 21:21 GET 216:28 850/1

CAPCOM Okay, America we're about LOS in 40 seconds. Everything looks good as it always has. See you next time around.

SC See you Gordie, and thanks for keeping an eye on us.

CAPCOM One last frank reminder to continue the DSE per the flight plan after LOS.

SC Okay, we got it.

PAO And, we've had loss of signal with Apollo 17 on this the 65th revolution. We'll be reacquiring as usual in about 45 minutes. And for the rest of the flight plan up to the crews sleep period which begins at about 220 hours we have relatively quiet time very little scheduled in the flight plan - have an eat period. During the next revolution the crew will be operating the panoramic camera in the SIM bay. They're scheduled to be in the midst of an exercise period at this time. And we could confirm from the biomedical data on Ron Evans his heart rate that he was indeed exercising. Prior to beginning the sleep period the crew will be going through their film magazines getting everything ready for an active day of picture taking tomorrow. There will be a lunar surface science briefing at 9:20 a.m. Saturday December 16 in the main auditorium building 1 at MSC. Again that time is 9:20 a.m. December 16. At 216 hours 37 minutes this is Apollo control Houston.

END OF TAPE

PAO This is Apollo Control at 217 hours. 18 minutes, and we'll be back in radio contact with Apollo 17 in about a minute. On this revolution, the major activities aboard the spacecraft will be the operation of scientific instruments. It's a relatively quiet period of time for the crew. The pan camera will be turned on briefly, just so we can get a look at the telemetry data on that camera. We won't be obtaining any photography with it. The mapping camera will be on for one full revolution obtaining ground track coverage supplemented by the laser altimeter data that provides an altitude reference in each photograph. Also the infrared and ultraviolet spectrometers will be operating and the crew will be taking a few hand held photographs out the spacecraft windows, using the Hasselblad camera. We may have a bit of noisy communications toward the beginning of this pass. We've just gotten acquisition of signal and we'll be receiving the spacecraft through one of the 85 foot dish antennas, rather than the 210 antenna. We do have acquisition of signal now and appear to have reasonably good signal strength.

AMERICA Houston, America. Looks like we're with you again.

CAPCOM Okay.

AMERICA (garbled) we've been taking these pictures just as we came up.

CAPCOM Rog. You're loud and clear.

AMERICA Okay.

CAPCOM America, Houston. I have three one-liners for the Flight Plan.

AMERICA Is this the same Flight Plan we've been working on up here?

CAPCOM I think it is.

AMERICA Okay, Gordy. Go ahead.

CAPCOM Okay, at 218:09, delete mapping camera retract; at 218:30, delete mapping camera laser altimeter cover CLOSED and at 219:59 next page, in addition to IR and UV covers OPEN, put in laser altimeter ON.

AMERICA Okay, at 219, mapping camera laser altimeter OPEN, and at 218:09, delete.

CAPCOM Okay, that second one was deleting a cover CLOSED, but I'm sure that's the one you got. Mapping camera laser altimeter cover CLOSED. And that laser altimeter, we'll just leave her run through the sleep period.

AMERICA Okay.

AMERICA May have. Smith may have on the thing. I still want to talk a little bit about these polygonal craters and Smythii. The one right above REV 62 picture on the thing, there's definitely kind of a, an undated old depression there with mare, very smooth mare floor on the thing. With two,

AMERICA two old craters. And that is definitely a younger flow than whatever made the polygonal crater-like depression. Right above the REV 62 number. The thing that bothers me about that is that they, they almost oh, looks like if you threw a rock in the mud, you know, to make a mud pie, and you get a wave or a ripple going out from there. In other words, you've got a high wave front going out from a circular direction with a slightly sloping up to that wave front. That's on the inner ring on the thing; the outer ring, of course, is a typical type ring that you get from an impact type of an operation. It looked like the rough looking floors of those rings, ring basins, essentially have the same albedo, the same characteristic as the rougher looking floor in the Mare Smythii itself.

CAPCOM Okay, Ron.

END OF TAPE

CAPCOM Okay, Ron.
CAPCOM We'll take high gain to AUTO.
SC Okay, you have it.

SC And I took a picture of that one in Smythii is frame 160 on mag November November, and the reason I took the picture is really because on the western edge of the big basin looks like there's a small impact crater, but it's only been dishd out in the more recent flat dark gray mare material. And looks like when it comes to the edge of the original basin ring, that part is not ejected out at all. So essentially you have a cone type depression with an impact crater. The materials only been excavated in the - in the newer mare material.

CAPCOM Okay, understand that. Say again where that one is.

SC Yeah, that's the one above rev 62 directly north of the Wright Brothers in the 12:00 position from the Wright Brothers.

CAPCOM Oh, okay.

SC You know, Houston, we're just passing over a little polygonal crater that's maybe 15 kilometers in diameter - 15 or 20 kilometers in diameter. It maybe 10 to 15 and down in the basis of it is kind of a polygonal fill. It again has that dark greenish black rock that is collected down at the bottom of it and you also see it creeping down the side of it. But I think one of the most significant features about the crater itself is that it has a swirl and these are honest to goodness, they look like swirls rather than rays. It has a swirl pattern around there. It's radial from that most recent impact.

CAPCOM Roger, Ron.

CAPCOM Back in Houston, we haven't got data right at the moment cause we are in a skin reflection zone. We'd like you to hold the pan camera to standby until we call you.

SC Thank you.

SC Okay.

SC It's near Xerxes. Come down from Xerxes. Xerxes is the subdued crater up there. Come down from Xerxes. There's a little one about 10 kilometers in diameter and then a big one that's about 50 and then there's a bright one. Okay, and then -

SC (garbled) crater.

SC Yeah. Then right, let me see kinda north-west of that bright one, about a crater and a half diameter from it it an orange ringed crater again.

SC See it - right, right, just a - bright one just about a crater and a half diameter from the bright one. See it. It's an orange ring on it. That's the one we were talking about. I'll get it. Yeah.

SC (garbled)
SC No. No. That's right. It's not as bright, but it's another example of an orangish tanish. See what? See that bright crater down there. Just about a crater and a half diameter to the north of it. Maybe 250, I don't know. And Houston, that was frame 162.
CAPCOM Okay, Ron.
SC Yeah, we -
SC And just before that I took one of a ridge just on the southern edge of Crissium on a - the pattern of the Massifs in that area were very impressive but two frames just before that.
CAPCOM Okay.
SC Ah, Houston, just one other question. I was looking around here at myself and I got mag Victor Victor which is the HBW for the Nikon, and looking at the flight plan it doesn't look like we're going to be able to use that any time. I just wonder if we might be able to use it for some of these terminator photos.
CAPCOM We'll check on the film. We'd like you to go wide for 10 seconds and then back to narrow.
SC Okay.
SC There's wide. Looks like that did it.
CAPCOM Okay, Ron, the high gain looks good and on the film it's your option on that magazine and there's no scheduled usage.
SC Oh, okay, thank you.
SC Okay, you want pan camera power ON now.
CAPCOM That's affirm. We're ready now.
SC Okay, it's on.
SC What?
SC You want to get it or I'll get it?
CAPCOM Okay, America we'll take pan camera power OFF now.
SC Okay, it's OFF.

END OF TAPE

SC The last time I was up in the air all the time on this SIM bay stuff.

SC Houston, areas in the landing site where we now know there are extensive blocks of the subfloor material particularly in the walls of the larger craters. I have the impression that those block fields from this altitude give a light bluish gray appearance.

CAPCOM Roger, Jack.

SC I don't know if I would extrapolate that in other craters, but we might start trying a little bit.

CAPCOM Roger.

SC Following that a little bit farther looking into Dawes the lower talus slopes of Dawes have about the same hue and are overlaying the first by a zone that's producing - or several ledges that seem to be producing white talus and above that is the - or make that very light gray talus and above that is a tan gray talus slope that carries right up to the rim of Dawes. So there are three distinct major stratigraphic units showing up in the talus slope in Dawes that I can see. Jack, can you see any holes in the - square holes in the floor of Dawes there?

SC No wait a minute now, I guess I was talking about the crater northeast of Dawes - let me check Dawes with the same sequence.

SC No, Dawes is the little one down there. That other one is - -

SC No, I take it back again that was Dawes I was talking about.

SC You were using the binocs? Yes, I talked about Dawes already with - - No those aren't holes down there, those are just great big - great big blocks that have fallen off the side of the mountain. Okay, between the tan gray and the very light gray there may be another thin and possibly intermittent zone of a - just a plain apparently gray unit forming in the talus slope.

SC And in the crater to the southeast - southwest excuse me of Dawes large crater I'll get the name in a minute. You see the lower blueish gray units and the next white unit or light gray unit up, but the brown gray unit is not nearly so evident at the top. In fact, I didn't really say I and recognize it there at all. I'll have to check that one, though, put a query by it.

CAPCOM Roger.

SC That's Bessel your talking about. The top of Serenity?

SC No, no the one back.

SC Oh Plinius.

SC Plinius?
SC Plinius is that rough looking one. Yes.
SC Yes, that was Plinius I was talking about.
SC Oh yes, yes the oranges, yes.
SC And the next large - well, it's not large not as big as Dawes. It's a reasonable size crater that to the west the talus is largely just white debris on the slope of it. But, it doesn't look like it penetrated nearly as deep as the other two we talked about.
SC Ah, Menalaus? Takay is the one that is out - right underneath us right now. And then Menelaus is right on the edge of the Serenitatis basin before you get to the Haemus Mountains.
SC Okay, looking at Menelaus you can see where the edge of Serenitatis goes through the crater. And, the north wall is quite distinctly to grayer let's say blueish gray than the south wall which is light - very light gray in the talus. My guess is that it's a very nearly vertical contact at that point.
CAPCOM Rog.
SC 3 saps away the talus is suggested, but talus does move vertically. Looking at the depression with all the color streaking in the talus on the walls, there I'll say again, that the more red looking unit or talus is coming from below the orangish gray material but it is not a continuous horizon at least not so far as the talus indicates. It's local spots that are giving the reddish color.
CAPCOM Okay.
SC Gordie, that particular impression doesn't look like it's an impact generated depression at all.
CAPCOM Roger.
SC We'll sure have to look and see if those things still look orange tomorrow, because yesterday Stoney looked kinda orange there on the northeast rim, but it sure doesn't today - Shorty, yeah. Dave's gonna learn the names of all those craters you guys named down there.
SC Oh yeah, I know, quite a bunch of them.
SC Hey, (gable) like them.
SC Decalldaire is what I call it.
SC Yeah, Ron Decalldaire - Im just correlating apparent colors now and hues and the lighter colored material there is comparable in hue to the subfloor color at the landing site.

END OF TAPE

SC The first one's F32 to 500.
SC Okay.
SC (Garble)
SC Gee, a window.
SC Window 5.
SC Window 5? Okay.
SC Count is 55 now on Romeo Romeo, Houston.
No, not until we come up to Tobias, just before Tobias Mare.
SC On the other side of Copernicus.
SC Right after 218. Okay.
CAPCOM Roger that Ron.
CAPCOM Ron, this is Houston. Do you want any help
from me calling the F stop changes on this P66 run, or do you
want to do it on board there?
SC Why don't you give me a little help here,
just kind of reminders? To F 11 about Tobias Mare, I guess,
is in the --
CAPCOM Okay. Then F 8 and a 1250 is at Braille AB.
SC Yeah, right.
CAPCOM Are you shooting pretty much straight down
or out of front on this one?
SC Let's see. Pretty much straight down on
this one.
CAPCOM Okay, I've got a realtime plot of your
longi -- yeah, longitude here, so I can call right on longitude.
SC Oh, okay. Yeah, I started before Tobias
Mare.
SC There goes - what's that? Oh, Aristarchus, okay?
SC About right in here -- good place.
SC Okay, Houston, back to talking about colors
a little bit. It looked as if Lower Talus is more - -
CAPCOM Hold one, Jack. It's about time for F 11,
Ron.
AMERICA Okay, F 11 at 500.
CAPCOM That's affirmative.
SC Euler is lower is blue-gray and the upper is
a very light gray from the talus slope up to the rim. Houston,
I can just start to see the peaks more exposed in the central
peak - the talus is exposed in the sunlight and it looks like
there's massive quantities of large boulders on the peaks.
CAPCOM Roger, Gene. Okay, it must be about time
for F 8 and 1/250th.
AMERICA Okay, there's a 250th, okay? Gonna get my
little see. Crater chain down there. Like a cylindrical-cone chain.
Like between Tobias Mare and Euler.
CAPCOM Roger. Okay, try F 56 at 1/25th.
SC 56 at 1/25th. Is this the last(garble)?
CAPCOM Last setting, right, and you should finish
up there Tobias Mare W.
SC Okay.

APOLLO 17 MISSION COMMENTARY 12/15/72 CST 23:47 GET 217:55 MC854/2

CAPCOM Or a little beyond.
SC Houston, the mapping camera is coming off.
CAPCOM Roger.
AMERICA Okay, Houston, we ended up on tray 80,
magazine RR.
CAPCOM Okay, Ron.
SC Hey, Houston, mapping camera, stand by now.
Image motion is off and laser altimeter off.
CAPCOM Roger.

END OF TAPE

AMERICA Houston, what do you read our glycol evap temp as? I tapped the gage up here and got a little bit of upward jump in temperature. Just curious how much a hang up it was.

CAPCOM Stand by. Okay, we show 66 of evap out temp.

AMERICA That's exactly what it jumped to. Okay.

AMERICA Gordo, I'm interested. How have you been reading me most all day today? I've been on lightweight headset, all the time.

CAPCOM I'd say you're fine, since I've been on. Let me check the rest of the day.

AMERICA No, it would be the same all day. You're - you're as good a data point as any. I haven't really tried to make any effort to talk into the mike or anything, I just been talking around it and if you're satisfied, I'm happy.

CAPCOM Okay, sounded good all day, no cut out or anything. No problem.

AMERICA Okay.

AMERICA Houston, America. The canister's changed.

CAPCOM Okay, Gene.

AMERICA I think you can stand by for some small torquing angles on this one. Right within the center of the sextant.

CAPCOM Okay.

AMERICA Well, did get five balls that time, but that's not bad.

CAPCOM We'll buy that. Well the Z axis here looks pretty good anyway. You're clear to torque.

AMERICA (Laughter) Okay. We'll torque at 21, I missed 30, let's go to 2145.

CAPCOM Okay. America, Houston. Request the H2 tank 2 fan ON. Over.

AMERICA Okay. H2 tank 2 fan is ON.

CAPCOM Okay, and the waste water dump that you'll start after LOS, should take 11 minutes, if you want to set your kitchen clock. Also a reminder, this time after LOS we go to REACQ. Over.

AMERICA (laughter) Okay. Thank you. Will do. We'll go to REACQ. Houston, the IR UV covers are closed.

CAPCOM Okeydoke.

PAO This is Apollo Control. Apollo 17 going behind the Moon on it's 66th revolution out of radio contact. The crew is scheduled to begin an 8 hour sleep period about 2 hours from now. The next revolution will be a rather quiet one. The crew is scheduled to eat prior to completing final checklist items before going to bed. And we do anticipate

APOLLO 17 MISSION COMMENTARY 12/15/72 GET 218:09 CST 24:02 MC 855/2

PAO having a change of shift press briefing,
which will start at around 12:15 to 12:30 a.m. in the MSC news
center briefing room. At 218 hours 35 minutes this Apollo
Control Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/15/72 00:05 CST 219:11 GET MC-856/1

PAO This is Apollo Control at 219 hours
11 minutes. Change of shift news conference is ready to
begin in the MSC News Center Briefing Room. We're 5-1/2
minutes away from acquisition of signal on the 67 revolution.
We'll tape and play back any conversation after the news
conference.

END OF TAPE

PAO This is Apollo Control at 219 hours
26 minutes. We are in contact with spacecraft America and
have accumulated a few minutes of tape. We'll play that
now.

AMERICA Hello, Houston, America.
CAPCOM Hello, America, Houston, glad to have you
back.

AMERICA Well, we got a good one for you, Bob, not
too good but in the midst of other things we let our waste water
go to zero on that dump - as a matter of fact, it went past zero,
and the purge is starting to fill up again and the best we
can tell on board that it shouldn't disturb anything, but
you might take a good look at it.

CAPCOM Okay, we've got our (garble) taking a
look at it.

AMERICA Okay. How are you doing tonight?

CAPCOM Not too badly. I'll have you to know
it's clear down here. We saw the Moon for the first time
since launch day. It's getting bright. It looks like you might
be somewhere over the terminator on Imbrium.

AMERICA Is that right?

CAPCOM First time we've seen the Moon since
launch day.

AMERICA Oh, that's beautiful. Your weather has
been that bad, huh?

CAPCOM That's affirm. Fog and drizzle and rain and rain.

AMERICA How much older do you feel, Bob?

CAPCOM About one day. Okay, America, we'd
like H2 tank 2 fans off, H-2 tank 2 off.

AMERICA They're off.

CAPCOM And, America, as you can tell from the
flight plan, we aren't expecting too much from you guys
this rev and we aren't expecting to send up too
much to you guys either. A reminder that we won't be ask-
ing Gene and Jack for the PRDs tonight but we certain-
ly would like them in the morning. So you might take
that into consideration and we'll be sending you a few
uplinks there after the flight plan at 220. Both the state
vector and the EMP 523. We also have a clock update that
we'll send up and it's a .04 seconds, so it's another
biggie.

MAERICA Okay, Bob, we'll make an effort
to get those PRDs and we can get one of them probably with-
out too much trouble, but if it's a case of restowing both
those suits to get the second one, well, no we're not going
to get it until EVA day. I'm sorry, but that's it.

CAPCOM We copy that. I guess they're back
stored in the L bag.

AMERICA Yes sir.

CAPCOM Okay, we'll want the onboard readouts there at the bottom of the page just before you go LOS. And I might pass up one little piece of news - very local news here. Concerning us members of the orange team, we're all extremely proud that you and Jack chose to call the soil you found the other night while we were on shift the orange soil. We think it is an obvious honor for the orange team to have been on shift at that point.

AMERICA Bob, you know our intent was certainly well meant and we certainly are glad you appreciate it. I detect a certain amount of skepticism whether it's really orange, though.

CAPCOM It looked orange on this TV.

AMERICA Could you really? Could you see the color and all?

CAPCOM Well, so did the blue ocean and the Earth and so did the white suits and everything else, but they looked orange on this TV, anyway.

AMERICA Is that on tonight?

CAPCOM We don't have any - no we've seen the two the only two charges for today. We don't have another charge for, I guess, about another 24 hours or so.

AMERICA I think I understand.

CAPCOM Rog. Ed is on the orange team, however.

AMERICA Bob, I would like a word from you, though, as to whether or not you think there is going to be any problem with that waste water dump to zero. We don't, after looking at it.

CAPCOM No, we aren't expecting any problems. They're looking at it. They're kind of amused but they're looking at it. And I'd like to pass up to you fellows -

AMERICA (garble) an interesting.

CAPCOM Go ahead.

AMERICA Alright, nothing, Bob.

CAPCOM Okay, I might also tell you fellows in case nobody told you yesterday that we tracked the LM on ascent for 30 seconds. Beautiful pitchover and we saw you going away from us after pitch over for 30 seconds. It came out quite well.

AMERICA Yes, sir. We heard that, good. I guess I was able to find 102 at .1.

CAPCOM In fact, Ed calculates that you were 480 feet 48 zero feet from the lens. As they say, too far is better than too close.

AMERICA Well, I was just going to say I cheated a little bit. I made a few stops and backed up a little bit out there.

CAPCOM You backed up, huh? That's another first, isn't it?

AMERICA No, I didn't back up that time, but I did back up.

CAPCOM We heard that one at station 7 - at 7,
wasn't it?

AMERICA No, that was somewhere during EVA-2,
I can't remember where. Houston, frame numbers 40
through 43 are timed sequences of the waste water dump. As
we were in the sunlight.

CAPCOM Okay, I copy that one.

AMERICA Yeah, Bob, just give us a call when you
want the computer.

CAPCOM Okay, about another half hour or so, I
guess, when we're ready. It will be about 220. And, a reminder
we got 220 they were going to go laser altimeter on and the IR
and UV covers opened as per your flight plan.

AMERICA Yes sir, I got laser on and IR UV open.

PAO This is Apollo Control. We're back live
now.

END OF TAPE

SC Hey Bob, while it's sort of quite anything of a news worthy - noteworthy news happen today?

CAPCOM Okay, stand by on that. From my recollection this evening, there really wasn't anything, but I'll check. Did you guys get news briefing this morning?

SC Yeah, we did.

CAPCOM Okay, we got some news coming over and we'll have it here before you go around the horn. Might just while things are quiet also pass up to you that if you run out of the Command Module film there, you do have 2 - you've got some LM surface film left as I'm sure you're aware and 2 mags in particular which look fine are mag Barbara and mag Karen. Barbara has 500 frames of CEX and Karen 100 frames of black and white, excuse me, 50 frames, not 500 of CEX. And 100 of black and white. These mags have never been fit checked on the command module camera but we believe that they will along - as long as we take precaution because the locks don't work the same, on the command module on the LM cameras, Number 1, Number 2 the focus won't be quite as good as on the - with the LM cameras, however, it will be satisfactory. So there's 150 frames there you might want to take advantage of in those 2 mags. We think those are in Romeo 2 stowage - stowage Romeo 2.

SC Yeah, yeah, we've already inventoried those. We've got our hands on them. However, we (garbled) coming up in the rendezvous and docking.

CAPCOM And just in case you got some left over, I want to shoot some of that black and white on the Moon. We got some instructions for you which we can call up in real time if you want to do it, different exposures. The CEX will be the same, of course, as the CEX is in the command module.

SC Okay. Bob, what factor on the black and white would you use?

CAPCOM Okay, Jack, if you use them, use the same sort you have on board for the CEX but you cut the shutter speed by a factor of 2. So it's - for instance you use 1/500 instead of 1/250. And so forth. Over.

SC Okay.

SC Say, Bob, I don't think - at least I haven't heard anything, concerning the home front for about 4 days. You haven't by any chance had any contact have you?

CAPCOM As a matter of fact, I haven't. And Gordy didn't talk to them tonight and - in fact Gordy and I talked about it on one of your - when we were doing the change over and I thought well it doesn't look like an opportune time to call up and find out right now. If you like, I can. I'm not sure whether they're still up or not, or I can leave instructions for Overmeyer in the morning to round people up and see what's going on. Oh, I'll make sure Overmeyer

CAPCOM does it in the morning.
SC Naw, naw don't worry about it, Bob. I was just curious. I - no news is as good as good news.

CAPCOM Yeah, that's my presumption. I kind of thought the day time people would have taken care of that. It's not the best time in the morning to call up right now. I'll make sure Overmeyer calls in the morning and checks on it.

SC Gordy gave us a briefing on the SIM bay and on the lunar surface experiments and it sounds like all that good liaison work you did paid off. Sounds like most everybody is pretty satisfied.

CAPCOM As far as I can tell, that's right. We - we try there fellow.

SC We thank you.

CAPCOM What can I say? We thank you guys too.

PAO This is Apollo Control at 219 hours 54 minutes. 38 minutes remaining in this pass. The crew is eating at the present time. America's orbit now 65.4 by 62.3 nautical miles.

END OF TAPE

CAPCOM Okay, America. Houston. We're ready for a little action there in the SIMBAY.

SC (garbled) is on.

CAPCOM Copy that, you just beat us by a minute and if you guys will give us -

SC It's already on, Bob.

CAPCOM Roger, and if you guys will give us the computer we'll send those updates to you.

SC Okay, you have the computer.

CAPCOM Okay. And if you guys want to sit and listen I'll broadcast you - it's possibly the world's shortest newscast.

SC Both covers are open and grey, Bob.

CAPCOM Okay, copy that.

SC Go ahead, Bob, on the news. We were waiting for you.

CAPCOM Oh, okay, I was waiting to see if you guys were ready to listen to it. The first item which has been a continuing item here during the flight - In Kansas City former President Harry S. Truman's condition continues to deteriorate as Doctors are unable to restore his vital kidney functions. On the Paris Peace Talks scene there has been essentially no apparent further developments today. It continues about the same. And in New York police are red-faced, it says, when it was learned that more than 50 pounds of heroin originally seized way back in 1962 - this is part of the French Connection business, has been stolen from the Police building where it was being kept as evidence. And a last local news item. Three prominent Houston men are missing. They were last seen in person at Cape Kennedy in Florida on December 6 but were apparently lost among the 500 000 people who watched the launch of Apollo 17. The following appeal, it says, is issued in case they are listening. Gene, Jack and Ron come home. And if you pass a fellow with a bushy white beard and crimson suit, advise him you'll be home before Christmas. That's the extent of the news.

SC We saw him the other morning briefly, Bob, and all four of us will be around at the right time.

CAPCOM That's good news. We'll pass it on.

SC Bob, I've got some on-board readouts if you want them.

CAPCOM Okay, we're ready to copy.

SC I'll just give them to you - okay - I don't know if you've got - yeah, in order - 36.7 37 37 RCS at 68 61 65 and 66.

CAPCOM Okay, we copy that and we'd like that battery manifold pressure reading that's 7A on the selector down there. 7 Alpha. - And, America, the computer is your's again.

SC Bob, 7 Alpha is 1.4.

CAPCOM Copy, 1.4 and to copy the computer is yours.

SC Yes sir. We got it.

END OF TAPE

CAPCOM Okay, and America, we'd like to configure our H2 tanks for the night. Tank 1 to OFF, tank 2 is all ready OFF and we'd like tank 3 to AUTO.

SC Okay, Houston, you've got tank 1 is OFF, tank 2 is OFF and 3 is AUTO.

CAPCOM Okay, thank you.

PAO This is Apollo Control at 220 hours 21 minutes. Clock shows 11 minutes 13 seconds before loss of signal on this revolution. However, because of the pointing angle of the high gain antenna on the spacecraft, which is now configured for the rest period, we anticipate an early LOS, perhaps 5 minutes prior to the clock time.

SC Houston, 17.

CAPCOM Roger, 17, go ahead.

SC Roger, as you - we approach having Earth-set you might be interested to know, being an astronomer, Bob, that we're getting a very bright specular reflection off the Earth now from the sun that produces - reproduces the suns image quite well.

CAPCOM Very good. And we're about, between 4 and 5 minutes from losing track of you guys tonight and you're go for LOS and go for sleep and we wont be saying any more to you coming around the horn but we'll be up listening to you though. But, we'll consider you guys going to sleep on the back side, over.

SC Okay, well, we're moving in that direction, partly to get the cabin cooled down, and we'll probably talk to you in the morning, before very long.

CAPCOM Okay, well then, open the windows if they get it cooled down to much, there.

SC By the way - okay.

CAPCOM And while you guys are sleeping tonight you might be glad to know that the old orange team will be sitting around the fireplace and they'll all be singing Christmas Carols.

SC That I believe. Is Stan serving coffee to you?

CAPCOM We're holding out for egg nog tonight.

SC Well, goodnight, Robert.

SC Goodnight, Geno.

SC Well, that would be appropriate, I don't - I think it's about time they treated the MOCR to something.

SC Goodnight, Robert.

CAPCOM Goodnight, Ron. Say goodnight, Dick.

SC Goodnight, Dick. And we'll see you in the morning, I guess, Bob, if you're still around and if not we'll see you tomorrow about this time.

CAPCOM Okay, and by then you'll be headed home.

SC Yes sir. And if my home front's listening, I just want to say goodnight and sleep tight.

SC Bob, that's the most beautiful crescent
Earth I've ever seen.

CAPCOM It's a nice place to come home to,
guys.

PAO This is Apollo Control, we have had
loss of signal on the 67th revolution. The crew of
Apollo 17 preparing for an 8 hour rest period now. That
rest period to begin at 220 hours 30 minutes, about - less
than, well, about right now as a matter of fact. All systems
on the spacecraft operating normally. We will be monitoring
the spacecraft through out the night while it is on the
front side of the Moon, although we do not plan to talk
to the crew on the next pass, we'll come up hourly during
the rest period with status reports. At 220 hours 30
minutes, this is Mission Control, Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/16/72 GET 221:37 CST 0230 MC-861/1

PAO This is Apollo Control at 221 hours
37 minutes. Apollo 17 is in the 58th revolution, coming up
over the landing site at Taurus-Littrow very shortly. We've
had no conversation with the crew since loss of signal on the
57th revolution, their rest period starting at that time.
All spacecraft systems are performing well, 6 hours and 40 minutes
remaining in the rest period. At 221 hours 37 minutes, this is
Mission Control Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/16/72 GET 222:37 CST 0330 MC-862/1

PAO This is Apollo Control at 222 hours
37 minutes. All is still going well with Apollo 17 now behind
the Moon in its 68th revolution. 5 hours 42 minutes remaining
in the crew's rest period. At 222 hours 37 minutes this is
Mission Control Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/16/72 GET 223:37 CST 0430 MC 863/1

PAO This is Apollo Control at 223 hours 37 minutes. The spacecraft America is orbiting the front side of the Moon in it's 69th revolution. Flight controllers are monitoring systems and all are performing well. The ultraviolet and infared experiments are being performed during this rest period of which 4 hours and 42 minutes remains. At 223 hours 37 minutes, this is Mission Control Houston.

END OF TAPE

PAO This is Apollo Control at 224 hours 37 minutes. The command module America is behind the Moon at this time in its 69th lunar revolution. All systems look good as they were monitored here prior to loss of signal. The crew is asleep with 3 hours 42 minutes remaining in this rest period. On awaking, the crew will continue to perform orbital science experiments and photography until approximately 5:30 p.m. central standard time today when the translunar insertion burn will be made and America and its crew will be on the way back to Earth. Approximately 30 minutes ago an attempt to turn on the lunar surface television camera was unsuccessful. The reason the camera did not respond to ground commands is not known at this time and another attempt to activate the camera probably will be made later today. At 224 hours 38 minutes this is Mission Control Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/16/72 CST 6:30 GET 225:37 865/1

PAO This is Apollo Control at 225 hours 37 minutes. Command Module America is on its 70th lunar revolution and in a few minutes will be over the Taurus-Littrow landing site. The crew is still asleep with 2 hours 42 minutes remaining in this rest period. About 5 minutes ago, a second attempt was made to activate the television camera on the lunar surface, again, without success. Another attempt may be made later today, and probably one attempt a day will be made for the next several days. At 225 hours 37 minutes, this is Mission Control Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/16/72 CST 07:30 GET 226:37 MC-866/1

PAO This is Apollo Control at 226 hours 37 minutes Apollo 17 is behind the Moon on its 70th revolution. Flight Director Neal Hutchenson and the Gold Team are preparing to relieve Flight Director Pete Frank and the Orange Team at this time. There will be no change of shift News Conference. The crew has been in a rest period since shortly after the Orange shift came in for flight control duties. One hour 42 minutes remaining in the crew rest period. We've had no conversation with the crew since the rest period began and all spacecraft systems are operating normally. Attempts at approximately 5:00 and 6:30 AM to turn on the lunar surface television camera were unsuccessful. The reason why the camera failed to respond to ground command is not known. And further attempts to activate the camera will be made. At 226 hours 38 minutes this is Mission Control, Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/16/72 08:30 CST 227:36 GET MC867/1

PAO This is Apollo Control at 227 hours
37 minutes ground elapsed time in the mission of Apollo
17. Spacecraft America now about a third of the way
across the front face of the moon in revolution 71.
Forty two minutes remaining until the crew is wakened.
Some 50 minutes until the spacecraft passes behind the
moon. In other words the awaken call will be made some
8 minutes prior to loss of signal on this front side pass.
And the crew will start their preparations for a fairly
busy day of orbital science tests and photography. And
the transearth injection burn late this afternoon. Presently
the spacecraft is in a 61.8 by 66.1 nautical mile lunar
orbit. Current velocity 5344 feet per second. We'll
bring up the air-ground circuit just prior to the wake up
call and follow the balance of the days activities live
and as they happen. And at 221:38 - 227:38 ground elapsed
time this is Apollo Control.

END OF TAPE

PAO This is Apollo Control at 228 hours 9 minutes ground elapsed time, less than a minute away from wakeup, and 19 minutes away from the time the Spacecraft America passes behind the Moon nearing the end of revolution number 71. Current Orbit 66.1 at apocynthion and 61.8 pericynthion, those are nautical miles. We'll stand by here as we wait for the wakeup call from the spacecraft communicator, Bob Overmyer. And whatever the music selection is this morning, which is becoming tradition for wakeup. We'll standby here for wakeup call.

Wakeup Music "Come On Baby Light My Fire".

CAPCOM Good morning, America.

CAPCOM Good morning, America.

CAPCOM Good morning, America, and we'd appreciate high-gained auto, so we could talk to you all the way through LOS.

SC Okay. We've got to get the guy on watch up here in a minute.

CAPCOM Time to put your feet on the floor and a smile on you face and face another day in Lunar Orbit. The last one.

SC They're there, but the fellow on watch is still asleep.

CAPCOM Roger. Would you like to play the music again to wake him up?

SC Apparently it has no affect. Good choice though.

CAPCOM We're going to light your fire today, Babe.

SC Okay, let me try to get auto without waking him. Stand by.

SC Hey, you better play the punch line of that song again, nobody believes you did it.

CAPCOM Gene, just before we get the lunar sound - before we get the recording going again, just remember you'll have to go manual in Y then a normal acquisition at AOS. And the angles on the dial are correct.

SC Okay. Hey - good morning.

CAPCOM Sound a little groggy.

SC Good morning Robert, how are you doing this morning?

CAPCOM Doing great. Stand by.

SC A little navy groggy. I think that's what you mean.

CAPCOM (Music - "Come on Baby Light My Fire".)

CAPCOM That's for the CMP. Do you believe it now?

SC Yeah, I heard it that time. Beautiful
Bob, we're going to get your picture and your set this time.
Right on number -

END OF TAPE

CAPCOM Is that from on board?
SC Say again -huh?
CAPCOM Did you hear that tape on board or
is that just a back - But we've got the song again in our
background here? Or do you all have that?
SC No, we had it and I think it's very
appropriate for today. And that's exactly what we're
going to do. Wait a minute and we'll play it back to you.
CAPCOM Okay, it's just -
SC (garble) none of those other guys.
CAPCOM America, Houston. You've got about
3 1/2 minutes till LOS and you're looking good. All
systems look good to us and have a good breakfast and
we'll see you on the other side.
SC Okay, Houston (garble).
PAO This is Apollo Control. We've had
loss of signal as Apollo 17 spacecraft, America, coasted
behind the moon nearing the end of revolution number 71.
A briefing on Apollo 17 lunar surface science will begin
momentarily in the main auditorium - repeat, main
auditorium at MSC. The briefing likely will last into the
next rev at least. The air-ground communications will be
taped and played back at the conclusion of the lunar surface
science press briefing. And at 228:28 ground elapsed time,
this is Apollo Control.

END OF TAPE

PAO This is Apollo Control at 230 hours ground elapsed time in the mission of Apollo 17. Now two thirds of the way across the front side of the Moon on lunar orbit number 42, and some 26 minutes away from loss of signal on this revolution. During the previous two-thirds of this 72 revolution, the Air-ground circuit has been down because of the press conference on Lunar Surface Science, underway in the main auditorium. We have some 24 minutes of tape accumulated from the air-ground. Primarily, the medical reports from the crew, the morning news and the usual exchanges that go on at this time of day, immediately after crew waking. The crew was awakened near the end of revolution 71 with a recording by the Lettermen of "Light My Fire" which is appropriate for today inasmuch as the crew will light off the big engine in the service module to come out of lunar orbit, and begin the 3 day flight back home. We'll start rolling the accumulated tape and go live as soon as that tape is played out. This is Apollo Control.

CAPCOM America, Houston. Realize you're eating and don't want to interrupt you, but if you get your headsets on, we'll give you some news.

SC Go ahead, Bob, we'll listen to some news.

CAPCOM Okay, let's give you the really important news first. Went around the horn here and over in Nassau Bay. Everybody's doing real fine and it looks like Tracy's going to go out and visit one of our bigger amusement centers around the country and going to have a great day, and everybody just looks forward to the EVA and the deorbit and the splash. Out in El Lago - everybody's fine out there, Ron. John's out selling Christmas trees today and Jamie's going to go out shopping with her Aunt sometime today and a little Christmas shopping - it's getting near that time of year. And one of your friends from Phoenix is due in today for the rest of the Mission I guess. And out in Tucson, it was a little early this morning, Jack, but everybody's up and about, and I talked to your Mother, and everybody's fine. She's getting anxious to go back to Silver City and see all the celebration. I guess those people out there are really enjoying it. They're getting wild about it. But everybody's fine all the way around, all the way around.

SC Thank you, Bob.

CAPCOM Okay, we'd like REACQ and narrow.

SC We're fine up here and I'm sure you told them that.

CAPCOM Oh, I didn't have to tell them that - they're listening. They heard everything already this morning - at all 3 places.

SC Well, we send our "Good morning" and our last wakeup day from the Moon.

CAPCOM Okay, here is a summary of the late news as compiled in the MSC Public Affairs Office. If you'd like it, we're ready to go with it.

SC Okay, we'd love to have it. Go ahead.

CAPCOM Okay, everyone - everybody is talking about the success of the Apollo 17 mission here in Houston, and the weather. It was cold this morning. Some thermometers in the Houston metropolitan area were in the mid-20's. The lowest official temperature for the city of Houston was 31. I might add, Ellington had a recorded 29. A huge high pressure system is dominating the mid-section of the nation. Barometric pressure reached a high of 30.7 in the Houston area this morning at about 5:00 A.M. With strong gusty winds, the chill factor was a five above in Houston, and about a minus 10 degrees in Galveston. Man, that's cold. The national Christmas tree was lighted last night in Washington by Vice President Spiro Agnew. A small crowd, braving cold and rainy weather, watched as the vice president threw the switch to light up the 70-foot spruce that came from Medicine Bow, Wyoming. During the ceremony, Mr. Agnew said we must remember the many servicemen who are missing in action or prisoners of war in Indo-China and pray for them this holiday season. North Vietnamese peace talk negotiator Le Duc Tho has told newsmen he is very optimistic about prospects for an early cease fire in Vietnam. Before leaving Paris, Le Duc Tho said he will remain in very close contact with Dr. Henry Kissinger. Dr. Kissinger is in Washington. A Paris radio station has said a peace pact signing is imminent, but the report has been denied in Washington. Former Treasury Secretary John Connolly says he expects to get a call from President Nixon shortly to carry out some foreign visits this coming year. One assignment may be a visit to Moscow. John Scali, a former newsman for ABC and a special consultant to President Nixon, is expected to be the next U.S. Ambassador to the United Nations. A formal announcement from the White House is expected in a few days. An explosion has taken the lives of 21 men in West Virginia. The blast occurred at a steel-making complex near Weirton, West Virginia, on the Ohio River. President Nixon has given the green light for a pay raise for all federal employees. The across-the-board increase of 5.14 percent will benefit both civilian and armed forces personnel. A 747 Jumbo Jet, while taking off out of Miami International yesterday, went through a flock of birds and reportedly lost - had an engine go out. The pilot turned the aircraft around and went out over the Atlantic and burned down some fuel and landed at Miami, but skidded off the runway, hit a concrete culvert, and sheared the nose gear. A few passengers fainted, but only 4 were injured when they went down the slide. The unexpected always deserves some attention. The small community of Westwood, Kansas, a suburb of Kansas City, will

CAPCOM send back a check it has received from the federal government in the federal revenue sharing program. Mayor Joe Dennis said Westwood just didn't need the money. On the regional and local scene - I just might add - I see it's not here that President Truman's condition seemed to deteriorate some last night, but he is still not listed on the critical list; he is serious. Miss Ima Hogg, the 90 year old founder of the Houston Symphony, was honored at a gala birthday party last night in a cake cutting ceremony at the Symphony. And little Tomball, Texas has had police trouble, but nearby Pasadena doesn't seem to have any. Thirteen new pretty policewomen have just joined the suburban police force out in Pasadena. And Jack, here's a special for you. If you ever get tired of cracking rocks, why not try politics. A geologist, J. Leonard Davidson, is going to run for mayor of Houston during the 1973 election. And we also received word this morning that an elementary school in Silver City, New Mexico, is being renamed for their most illustrious graduate. It will now be the Harrison H. Schmitt Elementary School in Silver City, New Mexico. A couple of new college coaches have been named. Dave Smith has been named the new coach of Southern Methodist. Up in West Lafayette, Indiana, a veteran coach has been named to improve football fortunes at Purdue. Alex Agase, former head coach at Northwestern, will take over the Boilermakers. Kent Nix is expected to get the nod as starting quarterback for the Oilers against the Cincinnati Bengals in the final game of the year. Pastorini is still out with a pulled hamstring muscle. The Houston Rockets dropped their basketball game with the Baltimore Bullets last night by a score of 94 to 91. Purdue beat Western Kentucky last night 91 to 75. Friendswood High School was eliminated last night in the Class 2A semifinals as they bowed to Boling at Rice Stadium 33 to 7. And a final in the news today, Marian Rice Hart, the 81-year-old American aviatrix, says she has at least two more years left for flying. Mrs. Hart is currently flying around the world in a single engine Beechcraft Bonanza. She is presently in Katmandu, India. That's all from Editor Jim Kukowski here. A special hello from the Spaceflight Tracking and Data Network crew around the world.

SC Thank you, Bob, and our hello and thank-you to the tracking team. We sure have been able to work well with them, and communications have been super.

CAPCOM That's real great. I'm sure those words will be appreciated up at Goddard and around the world of course.

SC Well, like a lot of other people - you know - you can't do it without them.

SC Bob, this is Jack. My appreciation and thanks for an unnecessary honor to Silver City.

- APOLLO 17 MISSION COMMENTARY 12/17/72 CST 10:53 GET 230:00 870/4

CAPCOM Roger, I'm sure they're listening out
there and just glad to do it.

END OF TAPE

CAPCOM Each run clear, Ron.

SC We're listening.

SC Cinnamon toast and bread cubes and for breakfast tea, grape juice and bacon squares, vitamin. For lunch frankfurters, 2 pieces of bread, catsup, orange drink and a package of pecans. Okay, for meal C, turkey and gravy, more orange juice, and lemonade. Now for the medical log - Commander's - 17052, 5 hours very good sleep, no medication and 3 cans of water. Okay, the old LMP, food, cinnamon toast and bread, instant breakfast, coffee, fruit cake, grape drink, peach ambrosia. Meal B frankfurters, 1 piece of bread, orange drink, sugar cookies, grape drink, and coffee. Meal Charlie, turkey and gravy, caramel candy, and orange juice. Okay, LMP medical log - the OPRG is still at the bottom of the sack down there. Had about 5 hours of sleep - no medication and 2 cans of water. Okay, the command module pilot had to eat, rice toast cereal, mixed fruit, instant breakfast, coffee, grape punch, cinnamon toast and cubes, brownies, vitamin. For lunch, 4 frankfurters, 2 pieces of bread, catsup, chocolate pudding, grape drink, coffee. Meal C, turkey and gravy, chocolate bar, orange beverage and pork and potatoes. Okay, CMP medical log 15050. About 5 hours of sleep, pretty good once I got some sleep. For medication two sniffs of nosedrops, each side, prior to retiring, and four cans of water. Over.

CAPCOM Roger, Ron, we got all that.

SC Okay.

CAPCOM Ron, could I jog your memory a minute back to the HF antenna extension period after docking?

SC Go ahead. We'll try.

CAPCOM Rog, Ron, we've been chasing a data dropout switch and we just wonder if trying to cover all bets - when you're extending HF antenna 1, could have you gone to operate on the immediate switch next to it which is the Lunar Sounder switch, was right next to one, could have gone to operate for a minute or two without realizing it while your hold - holding one to extend?

SC Standby, Bob. Which extension anomaly are you talking about, the one prior to rendezvous?

CAPCOM No, the one after rendezvous and docking when we were putting them with those - they're out now and when we put them out - whenever you're putting them out and we're extending HF antenna 1, the lunar sounder operate switch is immediately connected to it and I realize HF antenna is a momentary switch when you're holding it there could have you gone to operate on that lunar sound equip?

SC Bob, I don't think so. I - no. No. I don't think so.

CAPCOM Okay, good show, good show. Okay we'll keep track of that.

SC I would have had - I would have had to been gone to the off position, too, I guess, right after that and I think I'd remember that.

CAPCOM Yeah, that's affirm. You would have had to go to off here and I didn't feel it but Joe and you know we got a data glitch - it's nothing serious - no problem - but they're just back there trying to track down all little glitches, and that does seem to be the only thing that could add up right now.

SC Sure, I - I understand. I understand. Yep. Hey, Bob, have you had any more charge firings on surface?

CAPCOM I don't believe so. When I came on shift they mentioned that the LCRU wasn't working right now and they were trying to work it.

SC Okay, just for an update we fired 6 and 7 last night and we'll be firing 1 at about 1 o'clock this afternoon.

SC They all went off okay, huh?

CAPCOM Yeah, and 4, 1 and 8 go off today. And we're seeing good results back on all the data.

SC Okay, has Bob Kovach gotten any depth to the debris cover or anything below it yet?

CAPCOM Let me check that out here before I get it to you, piecemeal here - we'll check it out.

SC I realize that's pushing a little bit but I'm curious.

SC Bob, how do you read 17?

CAPCOM Read you loud and clear, Jack.

SC Okay, I'm looking right down the slope of the South Massif above the slide right now. Right down in just about the angle of the slope and there's a very light indentation in the slope just opposite the maximum - the point of maximum extent of the light mantle. Opposite other portions of it, though, there's no clear indication of any change in the direction of the Massif front. It's very, very slight and I'd say you'd have a hard time saying that it is a source area for the light mantle but it's - there's a slight indentation.

CAPCOM Roger.

SC I'm just north of the - of the bright rayed craters in the Littrow area. There are 5 craters, oh probably in the thousand meter diameter class range, 500 to 1000 and all five of those have the sequence of colors in the walls from rim down of a brown gray - blue gray and then brown gray. They are all identical in that sequence and quite clear.

CAPCOM Roger.

SC And that blue gray is comparable to the blue gray that's visible in the craters such as Sherlock in the landing area. And along the - Robin in the vicinity of those 5 craters there is a series of very black spots. I'm going to have to look at that again on the next pass if we can. I don't have any idea what those spots are but I'm looking very obliquely now to that Robin and -

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/16/72 11:13 CST 230:20 GET MC-872/1

AMERICA Very bleakly now to that Robin and it's extremely - black spots along that Robin.

CAPCOM Roger.

CAPCOM Ron, NOUN 26 doesn't require a sign.

AMERICA Thank you, Bob. I've heard more about SP 20 on this side of the tunnel this mission than I ever could have.

CAPCOM Rog. Looks like you guys are ready to go to work.

AMERICA Well (laughing) yep, we are. We're ready to do anything you want to do.

CAPCOM Okay, we need a cut like your CSM state vector.

AMERICA Okay, sock it to us.

CAPCOM Okay, it's on its way. Going down the flight plan, we've got a flight plan update if you're ready to copy. Isn't too awful long, although it's not the easiest one.

AMERICA Go ahead, Bob.

CAPCOM Okay, at 230:20, 230:20 add the following:
Laser altimeter, off, LA off.

AMERICA Just keep pressing on, Bob, I'll get them and let you know if I get them all.

CAPCOM Okay, at 230:20, laser altimeter, off; at 230:29, add verify all VHF off; at 230:31, delete waste water dump; at 230:40, scratch out LMP and put CDR don biomed harnesses. Put CDR in place of LMP.

AMERICA Hey, that wasn't a flight plan update we passed on yesterday, I've got those.

CAPCOM Okay, just keep going on down the line here. At 231:29, change - check LMP biomed to check Commander biomed, and change CDR doff to CMP doff. Okay. And the computer's yours, by the way. You can make a block. And this is the one important one here, we want to make sure, and I'll explain a little bit, over at 232:27, 232:27, if lunar sounder operate talkback flag goes barber pole, switch lunar sounder operate to standby. The situation here is that it might run out of film during this lunar sounder HS target on hertz (garble). If it does, we need to go to standby immediately and it'll probably require somebody monitoring that panel during that 5 to 6 minute pass there. Our best guess is - our best guess is we've got a 5 minute PAD on that film but this is just a precaution. And at 233:13 after pan camera power add V over H override high altitude. Okay, that ends the flight plan update. I've got a lunar sounder PAD.

AMERICA Okay.

CAPCOM Okay, lunar sounder PAD is at 230:55, 230:55
T-start time: 231:00.00. T-stop time is at 0758.

AMERICA Is that everything, or you got a couple more sounder PAD's?

CAPCOM Ah; that's the only sounder PAD for now.

AMERICA Okay, if - let me just run it back through you to make sure I got them right.

APOLLO 17 MISSION COMMENTARY 1]/16/72 11:13 CST 230:20 GET MC-872/2

CAPCOM Go ahead.

AMERICA Okay, at 230:21 you want the laser altimeter off. At 230:30 you want to verify all the VHF is off. And we want to eliminate the waste water dump at 230:31. The sounder PAD on that page is 231:00 and 231:07.58. At 232 following lunar sounder operate for that PAD, if the operate talkback goes barber pole, we want to switch the lunar sounder operate to standby, and we'll be monitoring the panel during that time. And at 233:12 following pan camera to Power, you want V over H to high alt.

CAPCOM That's a good readback, Gene. I have a PDI 75 preliminary TEI 75 PAD for your update book.

AMERICA Go ahead, Bob.

CAPCOM Okay, that's preliminary TEI 75; SPS/G&N: 36372 plus 063, plus 086 236 42 08 58. NOUN 81: plus 30403, minus 01833, plus 00804 180 000 000. HA is not applicable. Plus 00230 30469 22530292. Sextant star is 06 1095 300. Boresight, and that is not applicable. NOUN 61: minus 1789 minus 16600 10472 36172. GET is 05G is 304:18.36. Over on the comments line, Sirius and Rigel: 136 071 035 4 jets 12 seconds on the ullage. I've got two assumptions, or rather two other comments. This PAD assumes TEI REFSMMAT. Comment two: With the liftoff REFSMMAT which you have in, it'll be roll 179, pitch 088, yaw 359. Over.

AMERICA Okay, Bob. TEI 75 preliminaries: SPS/G&N, 36372 plus 063 plus 086 236 420858 plus 30403 minus 01833 plus 00804 180 all zeros all zeros. HA is N/A plus 00230 30469 22530292 061095 300. Boresight is N/A minus 1789 minus 16600 10472 36172 3041836 -

END OF TAPE

SC 1836 Sirius and Rigel 136071 035 4 jett
12 second ullage assume TDI REFSMMAT. If lift off REFSMMAT
attitude is 17 9088 359.

CAPCOM Real good read back. No problems.
Got a consumable update here for you on RCS update we're
right on the flight plan and we've got 56 percent remaining.
And the O2 and H2 are basically right on the flight plan
and there we've got plenty remaining. No problem on that.
And for the - for Jack for the LMP I've got a special
flight plan update on you crew option photo target on
Kukowski. Would you like to copy that?

SC Stand by one.

CAPCOM And we'd like high-gain to AUTO.

SC Okay, Bob, what's this update?

CAPCOM Okay, Jack, it's 232:55 this is the
LMP crew option photo target Seocoski.

SC Go ahead.

CAPCOM Okay, they're recommending CM5 to EL
80 or 250 - I guess your option HPW - maybe that should
be VHPW - I'll take that out but HPW is what they've got
here - exposure from crew option photo chart as listed
except change 1/250th to 1/500th for the 80 millimeter lens.
Change 1/125th to 1/250th for the 250 millimeter lens. Recommend
use lunar surface mag Kilo Kilo. That's use lunar surface
mag Kilo. Record frame number for start-stop.

CAPCOM Okay, and I've been corrected that is
HPW. That's one of those surface mags that I guess I
don't know anything about. And we would like cryo tank
configuration H2 tank 3 fans to OFF; H2 tank 2 fans to ON.
Over.

SC Okay, you've got that and the photo
pads are mag. kilo, vee the 80 or 250 millimeter lens.
HPW exposures as per chart except change 1/250th to 1/500th
for the 80 and 1/125th to 1/250th for the 250 millimeter lens.

CAPCOM Roger, Jack.

SC And record the frames.

CAPCOM Good show.

SC Bob, just had a good view of the sun
set and the corona and there are two strong bright streamers
just right at sunset. One parallel to the plane of the ecliptic and
the other - oh, maybe 10 degrees to the south of the plane
and they form two of the major longer daw - daughter streamers
that are streaming out from the sun now. There are some
other linear streamers that are still visible but those were
the major ones. Once you get out about to the position of
Mars, they all have about the same intensity, which is very low.

APOLLO 17 MISSION COMMENTARY 12/16/72 11:23 CST 230:30 GET MC873/2

CAPCOM Roger.
SC The pattern is distinctly different from the one I believe I mentioned to you yesterday.
CAPCOM Roger.
SC It was right at sunset at any rate. Still have a very strong glow visible at the sunset point.
CAPCOM Roger.
SC And that glow - the - the general glow visible to me now - and of course I'm not very well lighted adapted dark adapted - but extends about to a position - oh, let's see - about the same distance from the Sun as the apparent distance of Venus between Venus and Mars right now. Well, let me - let me start over on that. The apparent distance of Venus to Mars is about the same distance as from Mars to the limit of the strong solar glow.
CAPCOM See the NOUN 05.
SC Talk about streamers. I'm talking about lens. Say again.
CAPCOM I said, "We see the NOUN 05". Go ahead, Jack.
SC Okay, I just wanted to tell you I've seen it and talking about each time. Very linear bright lines that extend, oh, maybe 2 or 3 crate - solar diameters out and then they merge quite sharply into a very long much duller streamers that - I guess presumably are zodiacal light.
CAPCOM Roger, Jack. We see the NOUN 93 if you can torque.
SC Okay, we're torquing at 45 now. Bob, I'm going to torque at 230:14.
CAPCOM Roger.
SC Okay, Houston, are you through with the high-gain now?
CAPCOM Stand by on that. We've just got on the horn and you're looking real good. Looks like we'll have AOS at 231 about 8 or 7 - right in there. We are now through with the high-gain.
SC We're - we're configuring now.
CAPCOM America, Houston. We didn't see the mapping camera go off. Did you get that one off?
SC That's affirmed. We've got mapping camera off, Bob.
CAPCOM Okay. Thank you. And your AOS time is update a little bit. It's 210:11 - 230:11. Try another one - 231:11.
SC What's this 231:11, Bob?
CAPCOM That's your AOS time. It's a little bit later than what the flight plan showed.

APOLLO 17 MISSION COMMENTARY 12/16/72 11:23 CST 230:30 GET MC873/3

SC Okay, fine, thank you.
PAO This is Apollo Control at 230 hours
37 minutes ground elapsed time. That completes the 72nd
revolution front side pass on a delayed playback. Spacecraft
America coming around on revolution 73 in 32 minutes.
We'll bring the line back up at that time. And at
230 hours 38 minutes this is Apollo Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/16/72 CST 12:03 GET 231:10 MC-874/1

PAO This is Apollo Control at 231 hours 9 minutes ground elapsed time. Fifty seconds away from acquisition of signal as America, Spacecraft America comes around the front side of the moon on revolution #73. We'll stand by as we wait confirmation from the network controller of acquisition of signal. Some initial transearth injection figures coming up later today around 5:33 Central Time. The tentative ignition time for transearth injection is ground elapsed 236:42:08 for posigrade velocity increase of 3046.9 feet per second. Total burn time of 2 minutes 24 seconds on the service propulsion system engine and we've had acquisition of signal from America. We'll stand by now, for resumption of communications as the spacecraft becomes electronically visible to the tracking stations on Earth.

CAPCOM Hello, America. You're a little scratchy down here we'll pick you up here shortly.

SC Okay. We'll stand by till then.

CAPCOM Oh, that's all right, we can hear you.

SC Okay, that last Lunar sounder pass got an extra 40 seconds on the film. 40 seconds on the last end of it.

CAPCOM Okay.

SC Okay, Houston. America.

CAPCOM Go ahead.

SC Okay, Bob. I was looking around outside and I hit the seal cell activator switch for about 1/2 a second - yeah, about that time. It looks okay here.

CAPCOM Roger. We copy that.

CAPCOM America, Houston. If you're reading us loud and clear, I'd like to give you a lunar sounder flight - sounder pad here at 23121.

SC Okay, Bob. Go ahead.

CAPCOM Okay, it's at 23121, the lunar sounder T-start time 231:26:18 T-stop 50:33.

SC Okay, I've got that. Thank you. You happy with (garble) on the CDR.

CAPCOM We won't know until we get the high-gain here at 21.

SC Okay.

END OF TAPE

APOLLO 17 MISSION COMMENTARY, 12/16/72 12:13CST 231:20GET 875/1

PAO This is Apollo Control, for those news men in the MSC news center who want to watch their television monitors they can see a playback of explosive package number 7 if they'll watch the lower left corner of the monitor you'll see a brief glow and then dims out again and that's all there is to see, we'll roll the video tape back through at this time.

SC Houston, America.

CAPCOM Go ahead, Ron.

SC Okay, just looking at the GARBLE going through there again and the outer beta ridge on that thing is kind of like the one - you know I saw above REV 62 in the picture, but the outer rim - is (garbled) in the opposite direction from the normal crater - there was a deep slope. And on the outside of the rim - you have a gradual slope up to the GARBLE. From the center of the crater you've got a gradual slope up to the rim and then it drops off to the steep slope on the outside. And the steep slope on the outside is maybe oh, 35 to 45 degrees - the slope on the inside is probably - somewhere around 20 degrees I guess. And there is one portion of the rim - kind of on the western portion of the one that I was looking at, anyhow, it's almost a delta shaped ring.

CAPCOM Roger, Ron, we're ready for the high gain if somebody can bring it up we can read you better.

CAPCOM How do you read, America, you're sounding great now.

SC Okay, looks like we've got you.

CAPCOM Real good. Go ahead, Ron.

SC Okay, I was just kind of reminiscing a little bit about the - my mud puddle craters there in Smythii. I guess that's what GARBLE with one of them. They've always kind of look alike to me. But they slope up. But the rims of those craters and even the interior rims on ones that are multi-ringed they slope upward from the center of the crater toward the rim and a gradual slope and then they drop off on the outside to the crater rim, sloping down from the outside crater up to 45 degrees and then at some points on there it almost look like it's a real plastic delta shaped rim on them where you have the same slope on the inside as well as the outside of the crater.

CAPCOM Roger, Ron.

SC Houston, you ready for mode VHF?

CAPCOM That's affirmative.

SC Okay, 50 seconds to lunar sounder operate, okay? Recorder is on, radar's on, we're in VHF, okay GARBLE. And what time? 2618. Okay, 40, 50, 60, 70 MARK it.

SC Sounder to operate.

CAPCOM America be advised, Gene your biomed looks good.

SC Thank you, Bob.

SC Okay, Houston, frame 163 and 164 and 165 were taken of the mud craters and Smythii and 166 I guess was taken of the great slopings - side of the crater in the (garble) That's just south of Yerkes -

END OF TAPE

AMERICA That's mag November, November. (Garble) It seems (garble).

CAPCOM America, Houston.

AMERICA All right, go ahead.

CAPCOM Ron, we did not get the high gain to NARROW, we have sequence for you which is important to go through so that we do not break lock and lose this lunar sounder VHF data. We would like you to dial in pitch minus 45, yaw 5, go to Manual Wide and when you get the signal strength, go to REACQ and then step to the beam Narrow, Medium, and Wide, or say in Wide narrow and Medium.

AMERICA Okay, I'm with you. Okay, I got minus 45 on the pitch, plus about 5 on the yaw --

CAPCOM That should be minus 45 on the pitch.

AMERICA -- and, what was that? That's what I got. Minus 45. And plus 5 on the yaw, right?

CAPCOM Affirmative. We're ready for you to do it, go ahead.

AMERICA And, we're going to Manual and wide. How's that?

CAPCOM That's great; we didn't drop any. That's great.

AMERICA (Garble) Hello, Bob.

CAPCOM Go ahead.

AMERICA Okay, this is Gene. I've got a very interesting crater out there in Tranquility I'd like to pass some info on for you. (Garble) It's part of the central part of Tranquility. It's got a very sharply raised lip, and it's got a very dark (garble) deposit. It's got a very, very obvious (garble) looks like it's elongated, basically to the generally to the east and to the west. I can't tell, but because of the shape of it, and because of those a -- darker rim deposits, I'm sure there must be an event there somewhere, but it's too dark down in there. I can't really see for sure whether there is one or not. But, if there is, I imagine it's pretty big. And, I can't tell, it's only sort of intuitive, but I imagine the elongation was produced during the thrust of the initial dynamics, the formation of the impact.

CAPCOM Roger, Gene. Do you have a scale on the size of the crater?

AMERICA Ask me about it. Let me look. Bob, yeah, -- I may have said Tranquility. I meant Fecunditatis. I did not mean Tranquility.

CAPCOM Copy.

AMERICA Bob, I'll have to give you an estimate on the -- on the relative size of it, but the length to width ratio is probably about 2 to 1, and it's certainly bigger than the Camelot size range.

CAPCOM Roger. That's good. Just wanted to pin it down further.

APOLLO 17 MISSION COMMENTARY 12/16/72 CST 12:23 GET 231:30 MC876/2

AMERICA (Garble) might be able to pick it up. Okay.
CAPCOM And, whoever's got the flight plan in their
hand, I've got a lunar sounder pad which is at 23220 and a pan
camera pad which is at 23320.
AMERICA Okay, Bob. I'm keeper of the left hand side
plus the manager of the flight plan here, so pass it up.
CAPCOM Okay. Lunar sounder pad. T-start time 2322611.
T-stop time 3418.
AMERICA Okay. 2611 3418.
CAPCOM Okay, pan camera photo pad, which is over at
23320. T-start time 2332407, T-stop 3842.
AMERICA 2332407 3842.
CAPCOM Roger. Good copy.

END OF TAPE

CAPCOM 17, just for your information, it's
Miami 3 Baltimore 0 - they're about midway through the first
quarter and Miami's making an effort to go undefeated today.
SC It's the last game of their season isn't
it?

CAPCOM That's right. This will be the undefeated
season if they hack it.

SC Houston, America. I took that reference -
information a couple of 3 days ago that - however, when we
first got up here - that I had a heck of a time seeing that
Tycho ray that goes out across Bessels. And I forgot to tell
you that yesterday - kind of for the first time - it really
started showing up when we were getting up in the higher
sun. And today it really shows up quite vividly. It's just
a ray that takes off from the engines during Crisium and goes
right across Bessel and goes out to about the middle of
Crisium - I don't mean Crisium, I mean Serenitatis, I was
talking about Serenitatis all the time.

CAPCOM Right.

SC Say, Bob. Those craters on the south-
western side of Serenitatis still have got that orange hue at
the sun angle, and that's with the naked eye.

CAPCOM Roger. These are the ones right in the
Skulpicius Gallus region?

SC Yes.

SC Hey, Houston, 166 and 167 are taken of
a crater that looks like it's got a reddish stripe on it
(garble) to the west of (garble)

SC Houston, a little more on that. It's an
impact crater with a line essentially across the diameter in
a east-west direction, maybe a little bit north of west dir-
ection and the ejecta to the north of that. We just
went under - the ejecta to the north of the line is the
orange - actually more red-brown than orange, although they're
both hues in it.

CAPCOM Roger, Jack. Can you give us some scale
on that crater.

SC Looks similar to - yes, it's about a
600 meter crater. And it looks very much like - in it's
geologic pattern to the - that crater out in the Nevada
test site on Buckboard Mesa that had an explosion along a
contact between 2 very sharply contrasting rock types. In
this case, however, the line does not go completely across
the crater, and that's why we feel it may be a dike or a
vein which pertuitively has been hit by that impact.

CAPCOM Okay, can you give me a little relation-
ship with respect to Skulpicius Gallus, the crater?

SC Yes, I'll try to spot it in a minute.

APOLLO 17 MISSION COMMENTARY 12/16/72 CST 12:33 GET 231:40 877/2

CAPCOM Okay, why don't you just mark it on your
map so for pre - postflight we'll have it.

SC On the - somewhere around, I'll try to
spot it more exactly, 20 north latitude line at about 7 east
on a ridge. It's right on top of a ridge. I think it's that
ridge. I'll try to spot it more exactly later.

CAPCOM Okay.

CAPCOM Ron, your less than a minute to lunar sounder
standby T-stop time.

END OF TAPE

SC (garble).

CAPCOM And, America, just a reminder. When your powering the SIM Bay, up here again the mapping camera lazer altimeter cover is all ready open and the mapping camera is all ready in (garble).

SC Okay. Thank you.

SC Okay, Bob. We'll just terminate those last 2 steps, is that correct?

CAPCOM That's affirmative.

SC Okay. You still want mapping cameras, stand by up there in the fourth step.

CAPCOM That's affirm.

SC Okay, Houston. The SIM BAY is powered up. We eliminated the last 2 steps.

CAPCOM Roger. Thank you, Gene.

SC Okay, Houston. I guess you saw those - we got through those procedures and you probably saw most of the switching. Sorry I should have been in VOX.

CAPCOM No problem.

PAO This is Apollo Control we're going to repeat the playback of the video tape of the explosive package number 7. This will be the final time it will be played back. If you'll look in the lower left corner behind a slight ridge, you'll see a glow part way through the playback. Let's watch the playback now.

SC Houston, this 17.

CAPCOM Go ahead.

SC One of the questions we asked ourselves years ago, when we mapped the Copernicus area, was were we really seeing dark mantling deposits on some of the Massifs of the Carpathions and looking at it obliquely here, it - some of those areas that we've mapped as dark mantling are distinctly brownish grey versus the normal tan grey of the - of most of the Carpathions. It looks like - and it's about the same color as extrapolating - as the dark mantle around Sulpicius and Taurus-Littrow.

CAPCOM Roger.

SC Also, the north boundary, the Carpathion Massifs have a very sharply defined high lava margin, and that's actually what we're seeing. And in - I'll mark the place on the map, but it looks like it extends about a 6th to an 8th of the way up the highest peak. It's quite a striking and obvious mark. There's a major textural change below the mark there's a little scarp that defines it, the texture is very smooth. Above that it has the lineated and typical mountain front texture for the Apennine - for the Imbrium range.

CAPCOM Roger.

SC Bob, I might summarize my impression of the Rilles in the vicinity of Euler and their relationship to

APOLLO 17 MISSION COMMENTARY 12/16/72 CST 12:43 GET 231:50 MC-878/2

SC the mare ridges. I've been able to oh, over
the last 3, just generally searching it out, I've been able to find
Rilles that clearly cross and separate portions of ridges. And ridges
that clearly cross and partially bury Rilles. And in another
third case a rille that appears to be levied - that is have banks
of - flat banks on either side

END OF TAPE

SC The sides, but near the end of it, it transitions into a mare ridge very clearly. It looks as if to me that the rille and ridge problem in here is just one of repetitive compression and extension within the sufficial flows of the Imbrium basin. And that possibly during the compressive stages there were extrusions locally along the ridge system, but the main part the ridge systems represent I think a domean it looks like just a domean of the mare surface except for these local ridge like extrusions.

CAPCOM Roger.

SC I might also add that the rilles to me seems to be made up of zig zag straight line segments rather than being truly senuous. They appear senuous because of the rounding of the corners, but in my impression is that their really made up of straight line segments.

SC And Houston on mag victor victor - oh, well I'm on number 28 now and the last ones before 28 there were taken of the spacecraft sunset terminator.

CAPCOM Roger Ron. Jack we just had a feed in to your answer to your question from ALSEP. The PI has not seen enough data at this time to draw any conclusions regarding the depth of the mantle in the landing area. And, we've got another bomb charge due to go off here in about - a short time let me check it.

SC Okay, I'll wait till we get back. Thank you.

CAPCOM That next charge goes off in 15 minutes, Jack. I don't have an exact GET yet.

SC Bob, is the LCRU still working?

CAPCOM Say again, please.

SC Bob, this is Geneo I was just wondering if the LCRU and the TCU were still working?

CAPCOM They think the LCRU failed last night.

CAPCOM Gene, they are going to try it again today, but they could not get a razit last night and they think its failed.

SC Okay.

CAPCOM We'd like auto on the high gain please.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/16/72 GET 232:10 CST 13:03 MC880/1

SC Houston, 17.

CAPCOM Go ahead.

SC Has Mark come up with a preliminary heat flow number yet or is he still equilibrating?

CAPCOM We'll check that, Jack.

CAPCOM Jack, nothing on that heat flow yet. It's still stabilizing. It'll be a while before they get any data. But we're watching the data payout here on the TV screen. They just had another one of those charges go off and it really does rap the old heaters.

SC Excellent.

SC Houston, mapping camera is OFF and the IR's OFF, pan camera self test OFF, UV is OFF, and the data system's OFF, and SM/AC power is OFF.

CAPCOM Okay, we, I think we copy that configuration change there. We're about 6 minutes to LOS. Just on the next pass, just be advised, we're going to change the HF antenna retract times to a little more - up a little bit more. We'll call you on that, before we want the HF antennas retracted.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/16/72 13:13 CST 232:20 GET 881/1

CAPCOM Warm up a little bit more. We'll call you on that before we want the HF antennas retracted and just an update is Miami 10 to nothing over Baltimore at the half.

SC Okay, we'll standby on a call on the retraction and got the score 10 to nothing.

SC Okay, Houston, America, when do want configures that you see? Do you want us to wait a couple minutes?

CAPCOM Rog. We'd like you to wait a couple minutes.

SC Okay, we'll standby for your call on DSE and the high gain.

SC Houston, America, are you giving any odds and the time we might get the barber pole from the lunar center?

CAPCOM We don't think you'll get it this group but that pad is now about a 4 minute pad. But it's getting so close I'd like to watch it.

SC Okay.

CAPCOM America, if we should loose you before our published LOS here, check the DSC and when you get the barber pole you can reconfigure. We're rewinding that tape now.

SC Yes, sir.

CAPCOM Okay, it's all rewound. You can go ahead and configure the DSC.

SC Hey, Bob, what about our configured high gain. We're getting close to T-start.

CAPCOM Roger, go ahead.

PAO This is Apollo Control at 232 hours 25 minutes ground elapsed time in the mission of Apollo 17. Spacecraft America has just gone behind the Moon on revolution number 73 running the last lunar sounder pass in lunar orbit. The spacecraft will reappear again starting with rev - revolution 74 in approximately 48 minutes. We'll rejoin the conversation live when it resumes next revolution. And at 2:22:36 ground elapsed time this is Apollo Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/16/72 GET 233:08 CST 14:01 MC882/1

PAO This is Apollo Control, 233 hours 8 minutes, Ground Elapse Time. Starting front side pass of revolution number 74 mission of Apollo 17. 40 seconds remaining until spacecraft acquisition by the antennas of the tracking network. Approximately 3 and a half hours until the spacecraft leaves lunar orbit for the trip back to Earth. To reiterate the current predicted times of and values of the transearth injection maneuver, ignition time currently estimated at Ground Elapse Time of 236 hours 42 minutes 8 seconds. Burn time of 2 minutes 24 seconds for a velocity increase in posigrade of 3046.9 feet per second. We have Apollo 17 acquired on the high gain apparently right around the corner.

CAPCOM Hello America. Houston is standing by.

SC Hey, America, Houston, this is America. We've got you loud and clear. A little late on picking you up that time, but worked okay.

SC Okay, I'll make a cue, cue back. It's finished right now and whatever frame number it was on when they left the lunar surface to 143. Okay, I'll get it. Okay. Whatever frame they were on on the lunar surface to 143 were selected shots by the LMP. Frame 143 to 172 were nearsight terminator photos of Tsiolkovsky.

CAPCOM Okay, Ron. We copy that right for the Flight Plan change.

SC Okay. And pan camera stereos, Jack looking at it. Verify stand by on stereo. Okay, pan camera power coming on. Oops, stand by here. Okay. DOH high altitude. Okay, pan camera's powered. Okay, got the power. Okay, we've got a T-start coming up here at 24:07, 12 minutes. (garble). Let's see. Houston, America. I only have one pan camera pad here. Is that correct?

CAPCOM Let me see. We've got one sitting right in front of us for 233:40. Do you want that one?

SC I don't have that one. I've got that one that starts at 24:07 and ends at 38:42.

CAPCOM That's correct, and you don't have the other one because we never said it. We've got it here ready to go.

SC Oh, Okay.

CAPCOM Okay, T-start time 233:48:15. T-stop is 234:00:30.

SC Okay, photo pad, T-start is 233:48:15. T-stop is 234:00:30.

CAPCOM Roger, Ron. And let me give you some words here that you might be interested in. Right now we're looking at probably pulling in those antennas at 233:45 or 46, right in that time frame. If those maneuvers, that should not work, we will have to jettison the antennas at around 234:3, 235:39. We have and we won't give it to you until we need it. We have V49 maneuver to a jet attitude for 234:25 and that'll keep in that attitude and

CAPCOM then we'll jettison the antennas at 235:43, and of course we'll have to bring up the logic power on those. We have this all available standing by and there's no sense passing it until we find out how the antennas do on retract.

SC Okay, that sounds reasonable. Do you have the, or you want to use the page in the experiment checklist there?

CAPCOM Roger, except for the NOUN 78's . We'll change those.

SC Oh, okay. Sounds good.

SC It's in the Volkswagen pocket. Okay.

SC I don't think we ever changed it though. Okay, the arrow's there, which indicates that we didn't do it. Okay, file cannister change 19 into A, take 17 and put it into A4. That's correct. At 24 we want pan camera.

SC Bob, while we're waiting for the pan camera time, quickly here. One of the ways that seems to be useful for determining the relative age of the larger basins, to me anyway, is the abundance of block fields on the slopes of the walls or the slopes of the central peaks. That abundance decreasing with increasing age and one of the comparisons that just made that it looks as if Tsiolkovsky and Sklodowska have about the same abundance of block fields on both those features of the crater. Presumably they would be about the same age.

CAPCOM Roger, Jack. I noted that.

SC Jack to me, Sklodowska is lot more subdued, though, than Tsiolkovsky on the ... Oh, okay.

SC It's just criteria? Yes.

END OF TAPE

SC And Houston the northern portions - I hate to use mud impact but that's what I'll call it Mouldering Basin structure there and it also has a delta shaped rim to it. There is kind of a moat between the inner ring and the outer ring and then it slopes again a gradual slope from the center of the crater up to the porous basin ring and with a steeper slope on the outside of the first ring going down into the moat. And then the outer ring has the delta - the delta shaped rim to it.

CAPCOM Roger, Ron we copy that.

SC Okay, four minutes to -

SC And, Bob you'll keep us honest on this pan cameras T start will you.

CAPCOM I sure will.

SC Okay, thank you.

SC And Houston surgeons may be interested to know CMPs blue bag number five was comparable to ground tests number three.

CAPCOM Roger Ron.

SC I think I should probably add no problem.

CAPCOM Understand no problems.

SC That's affirmative. (Laughter). The LMP would like to make a comment, but I won't let him.

CAPCOM Things pretty miserable up there?

SC For a while it was.

CAPCOM Ground test bag number three wasn't the one you had to drive in with was it?

SC Yes.

CAPCOM Your 30 seconds to T-start time on that pan camera.

SC Okay pan camera to operate at 07. Jack I'll give you a mark on that.

SC Okay, 1, 2, 3 start at 7, 4, 5, 6, mark it. Okay, stop will be 3842. And Houston how would you like to have a verb 74?

CAPCOM Roger, we're standing by for it.

SC Okay, verb 74 enter.

SC Now take a good - yes, I got a picture of one of those with - that stars is kind of a clymic I think. Can you get it? I can get it right here. It's a lot easier, Jack. Yes, that's alright I can do it. I'll lay it down beside it. There we go. That's 80 to 250 that'll be good. Okay, is that what we call star? Okay, that's right, I didn't think this was star. That's the one I was talking about having the splygonal base on it and it's west of Mare Smythii for sure I don't know where we - directly south of - eastern edge of Fecunditatis. And that's frame number 14 I guess mag papa papa.

APOLLO 17 MISSION COMMENTARY 12/16/72 CST 14:11 GET 233:18 883/2

CAPCOM Ron, if you'll give us accept we'll give you your TEI REFSMMAT.

SC Outstanding, you have accept. And, while we are getting a TEI REFSMMAT there's a fairly striking graben on the very north edge of Fecunditatis south of Crisium. Just south of Crisium and it starts in the west within the Fecunditatis mare and then curves gradually up through the Sculptured Hills structure to the north. And, there is a crater looks like a subdued impact crater right on taht structure, and you can see the trace of the graben down the walls - the west wall of the crater and up the east wall. And it does - from directly overhead and appears to taper downward. The walls of the graben that is get closer together as approach the bottom of the crater. And on the south wall of the graben as exposed in the west wall of the crater there is a fairly sharp - sharply defined white area in the talus.

END OF TAPE

CAPCOM America the computer's yours you can go to block.

SC Okay, we're in block.

SC With the old pan camera ready we probably can find that graben section there pretty well. Yes, we ought to get some good pictures. It isn't quite as good that way, but you do get some pictures.

SC That's what I was trying to figure out. Houston, what's that big crater we're going over right now in Fecunditatis. It's probably on your map - yes, Taruntius that's it, yes. Ah, speaking of grabens again - hows our pan camera?

SC 38 and we still got 18.

SC Speaking of grabens again, on the southeastern blanket of Taruntius about a crater radius outward there is a crater looks like an impact also on a trace of a graben and in this case the ejecta blanket that extends out along the graben most of the west and to the east is noticeably blue gray against tan gray of the Fecunditatis (garble) Taruntius ejecta blanket. Basically, it looks like blue gray wings on the crater along the direction of the graben.

CAPCOM Roger Jack.

SC Looking at the crater (Garble) in the north eastern and northern portions of Tranquility. It looks as if you could say that there is blue gray mare materials overlying very light gray material of some kind. Without any strong exceptions that I can see and it resembles the same (garble) that I think I talked about yesterday on the annulus of Serenitatis and that goes along with what I think Ron told you that the visual appearance of the annulus and the northern tranquility mare on the surface is indistinguishable.

SC It also suggests that the mare in the (garble) thin as your getting down to whatever the basement rock is and that being represented by the light gray. The legends of the blue gray material are high up in the crater and really appear to form only about - oh a fifth to a sixth of the wall height. And I'll give you a crater - there's a crater right between the two Couchie rilles that shows this fairly well. And Ross crater also shows it a little farther along I remember from last time.

SC Couchie Crater isn't it?

SC Yes, Couchie crater is the one I was talking about between the two rilles. Actually, it's not as well defined in Couchie as it is in some of the other craters.

SC The western end of the Couchie rilles both north and south seem to have a right lateral (garble) on structure, but along the trades still to the west of the crater couchie that locally changes to less lateral.

SC And, Houston even at the high sun angle here the ejecta of the - oh it's four or five recent craters there at Miraldi still kind of a bluish gray light bluish gray. The floor of the crater Miraldi is essentially a dark form a dark gray today I guess than anything. And, the ejecta patterns on that are the same albedo and color distinctions as the ones at the landing site. And, the landing site itself from this angle I think it's going to - no, once we get up at the same viewing angle as we had on Miraldi the matleing material in the landing site is the same color same albedo as Miraldi.

CAPCOM Roger.

SC In the crater Miraldi.

SC Yes, I get just a tint of - yes I was going to say well I still get a feeling that there is just a twinge of orange or tanish orange around Shorty looking at it with the binocs. That black bump on the sides - let's see south of the southern sides of the south massif. Can you see that one Jack?

SC Okay, we ought to be getting ready for P38.

SC About another minute Jack. Pan camera to stand by - at 3842.

SC Okay, 35 now we want to stop at 42.
Okay, mark it. Okay.

END OF TAPE

CAPCOM America, we'd like AUTO on the high gain.
SC AUTO it is.
CAPCOM Ron, the numbers on magazine RR show that you have 9 spare frames and you will need 9 frames there for calibration, so looks like you'll have 9 frames on mag RR for whatever you want to use them on.
SC Okay, let's see now. We have just, this next pass coming up here?
CAPCOM That's affirmative, Ron.
SC It's setting on 85 now. Okay, at Tsiolkovsky, we got those the last time with, on the LM mag, is that correct?
SC Hey, Jack, we want to get Decaldare to high Sun here too. And then, yes, and then the crater with the dike in it, because I think we probably should get those ... Yes, that'll probably be it. And as soon as you finished with those, we'll switch mags and I'll whip over there and take some terminator photos. Okay, let's see ... Hey, Houston, you sure you want to start retracting the antennas?
CAPCOM Oh, stand by, Ron. Just to answer your question on mag Romeo, Romeo, you can take it to an absolute number of 106 on the frame count, and the remainder must be used for calibration.
SC Okay, the 106 as far as we go on that. Okay.
Thank you.
SC Find. Okay.
CAPCOM America, Houston. After we start the pan camera at 233:48:15, we would like then to go and start to retract HF antenna number 2. Number 2 first please.
SC Okay. So when I get the pan camera started, we'll go to retract on that.
SC Jack, are you talking about the one that's got the red ejecta out to the east. Yes. Right now. Just now looking down there. Is that the one you were talking about? Okay. It's just now coming up. Okay, can you see Decaldare? Okay. Okay, I'll get it. Let's see, we're almost at subsolar. Wait a minute, I don't know where we are. Right. We're way past subsolar. Yes, I think.
SC Okay, Houston, on Papa, Papa frames 13 and 14 were of the crater with the red brown orange vein across it and 15 and 16 were of Decaldare, stereo pairs.
SC See your (garble) lights Jack.
SC Hey, Houston, I saw at least two other examples of impact craters in the highland south of Serenitatis, south of the Sovicius area that had vein-like distribution of red brown or orange material in them.
CAPCOM Roger.
SC And for terminator, but you want to handle the retract or the (garble). It says at 48:15 go to pan camera to

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SC OPERATE. Yes, and then we start retracting HF number 2. (garble) fuck cut my finger on the torque (garble) Boy, that son of a buck. Yes. That's right. Yes we'll time it to start with HF number 2. 48:15, 47:15, 47 twice. And let's see where does this thing start? 52, I guess. No, 57. Okay, 48:15 stand by. 11, 12, 13, 14, mark it. Okay. And Houston, HF antenna number 2 is going to retract. 3, 1, mark it. Barber pole.

END OF TAPE

SC They can do it down there. In the
case of the -
SC I think they've been taking about 2 minutes,
last I - forgot for sure.
SC Houston knows. How about long is it
supposed to take to retract (garble) this time.
S (laughter) any (garbled)
CAPCOM Ah, 130 seconds would be nominal
retraction.
SC 130, huh. Would be nominal? No. 2, yeah.
SC Yeah, it's number one on your side.
SC Yeah that's the one. We had trouble getting it
out, the second time. Can't find my dip. Just took a long
time to get out there. Yeah, we're taking it out now.
SC Gene, yeah, we're doing this now but we need
a T-stop here, just a - on the pan camera.
CAPCOM How does the barber pole look up there,
boys?
SC (garbled) It looks gray. Okay,
CAPCOM That's a full retract.
SC Good. Beautiful.
SC Now you want to do number 1.
CAPCOM That's affirmative and the time of the
other was (garble).
SC Okay, Houston. Going to retract on
number 1. Mark it. Barber pole. Okay, Houston. I got it
officially going in.
SC Yeah, it doesn't come in very fast, does
it?
SC (laughter)
SC Oh, yeah, yeah, yeah, yeah.
SC Oh, okay.
CAPCOM America to Houston. Go to OFF on the
switch where it stall-current. Do you have a barber pole
or is it gray?
SC It was still a barber pole. And do you
want number 2 off.
CAPCOM Standby, Ron.
SC Just fasten -
CAPCOM That's affirmative, Ron, number 2 to OFF.
SC Okay, number 2 is - going to OFF at?
CAPCOM Okay, and the preliminary quick look
shows a nominal retract on both of them, Ron.
SC Ah, mighty fine. That's good. Although
I - have to get the camera ready here to take some pictures.

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SC Well, look at the one down here by -
you can pick linear segments if you want to on some of them.
One long one that goes all the way across there now, it's
got a bunch of - Well, this is a (garble) one down
right down here. Look at this one. Right down here. See, just
this side of that (garble) - the short one.

SC Okay, give me a holler on the pan camera.
You taking pictures here.

SC Yeah.

SC (garbled)

SC Ah, it really shows a up a fold from the
Tobias-Myer area coming on out to - ah, I don't know what a -
Ethey Rille or something like that. I don't know what that
Rille is.

SC I agree with you Jack, and that whatever that
Rille is, it's running east and west there. Made up of
linear segments, except for the curves around the corner.
(laughter)

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/16/72 CST 14:51 GET 233:58 MC887/1

SC I think that's the first one up there --
Yeah. Could you get them back there?
SC Yeah.
SC Here, take it. Uh, should -- should be --
oh, the lowest one?
SC Yeah, on your right hand side.
SC Oh, well, let me get these first then. RPD8
get those now.
SC Yeah.
SC Okay.
SC Here. I'll get the pan camera. That's the
lowest one. Yeah, that's the terminator, right on the terminator.
I got something on it. Okay. Here. Can't hack this, Gene.
Okay? Okay, pan camera, standby.
SC You got it?
SC Yep. What's my frame number here? Oh, wait
a minute. It's 105. Want to take one more picture.
CAPCOM Ron, did you get the pan camera to T-stop?
SC Yes sir. That's it, good, got it.
SC Frame 106. That's the last one we could use
on this one.
SC Where -- where's our stars? Let me take a
look, can I - Ohhh, yeah. Okay. Down in R1.
SC Okay, let's see -- Houston, in Earthlight,
we have a dim but good view of the Cruger's head and Shroters
Valley and the Aristarchus Plateau. It's not as bright as it was
the first night we were here, but still light enough to distinguish
their outlines.
CAPCOM Roger.
SC Okay. That's all the holes it's coming from.
And, Houston, we're ready to go to the retrack to the mapping
camera. Okay, 3, 2, 1, mark it. Barber pole. Okay, we'll stand
by on your cue for the camera. Okay. Well, there's nothing to that.
CAPCOM Pan camera power to OFF, America.
SC Power's off.
SC Okay, laser altimeter's off.
SC Okay, stand by for P52.
SC Okay, the mapping camera cover is going to
CLOSE. Mark it.
CAPCOM Negative, negative on that, crew.
SC And, it's great.
SC Hey, negative. Don't -- You got away with it.
SC That's my fault, Bob. I thought that camera
was already in when you gave us the GO on that.
SC And, I put it back to OPEN, and it went
Barber Pole then grey again. It acted properly.
CAPCOM Roger.
SC The mapping camera's closed now. It's re-
tracted, I mean. Yeah, we're okay.

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SC Houston, I'll just stand by for your GO on closing that cover.

CAPCOM Roger. Stand by.

CAPCOM Ron, we'd like one test here. We'd like to take the mapping camera track switched to RETRACT and verify the Barber Pole stays grey.

SC Houston, it's in RETRACT right now or still is, and has been all the time, and Barber Pole is still up is still grey.

CAPCOM Okay, you're clear to close the mapping camera laser altimeter cover.

SC Okay.

SC Okay, it's closed. Barber Pole, then grey.

END OF TAPE

SC Ah, I recognized Sirius.
SC Gave you another easy one.
SC Yeah, another easy one.
SC That's Regulus, I think, Huh?
SC 22
SC Yeah, (garbled)
SC Okay. The dot on the question mark.
SC A little harder to see but I think that's
it.
SC Yeah, maybe you ought to do that one again.
SC Yeah.
SC Rigel, this time, okay?
SC 21, Alphonsus. Okay, down below Sirius.
SC Okay, that's plain old one.
CAPCOM We'll buy that.
SC Plus .065 minus .050 minus .039. Okay
we'll talk at 14:15.
CAPCOM Roger, Ron, we copied those.
SC No, it doesn't make any difference.
SC Okay.
SC Okay, 1 enter. Okay, let's (garble) let's
go to the TEI (garble). To 55144. About 9 degrees in pitch
isn't it? Difference?
SC Yeah, okay. That's good. Man knows what
they're doing. Okay, REFs CMC 3 mid-coarse aline. Okay,
procede. No hat.
SC Yeah, Pick a Pear. Yeah, still
likes Rigel. Man, there's a big one.
SC 21 should be Alphard, I think. Two stars,
huh? Yeah, that's a long ways away off. It's outside of
the field of view of the first one. Both of them were.
SC Okay, 21. Well. Yeah, that's the coarse
of this (garbled) then I'll do another one.

END OF TAPE

SC (Huming). (Garble). Ah, yes that brought it in there nice and close. We'll just tweak her up just for the heck of it. Yep. Well - how's our time doing? Well that was close enough really but that's within the limits but I would like to get her down to at least .01.

SC Houston, you want those O2 tank heaters pulled on?

CAPCOM That's affirmative, Geneo.

SC Okay, we'll pull the O2 tank 51 heaters three of them -

SC Three of them open and the O2 - 1 and 2 hundred watt heaters closed. Okay, those heaters taken care of Houston.

CAPCOM America Houston, we see you going around the corner here and you're looking good as you go by us.

SC Okay, thank you. Well the heck with it (laughter). Okay.

CAPCOM You got lots of CMPs watching today Ron.

SC CDRs taken over now.

SC And after that the LMP tries one.

CAPCOM Do you take turns (garble).

SC (Laughter) no sir I just got tired of looking at it that's why 'm going to do the next one.

CAPCOM Ron, Stu said that all CMPs ought to accept the two. It just makes you more humble.

SC Yes, I know. I've really accepted it. But, I just thought I could do better. And one thing that you can't do is make Ron more humble.

CAPCOM Just a reminder with one minute to go, Ron. We want to remind you to go back to auto to the auto pilot when your done with your 52s then the final score in the game was 16 to 0 Miami over Baltimore.

SC Okay, mighty fine. Commander standing here trying his luck now.

CAPCOM We're all watching. We just hope we see it before you go LOS.

SC (Laughter).

SC If we don't hear about it if you miss it don't worry - -

PAO This is Apollo control. We've had loss of signal as the spacecraft America passed behind the Moon on revolution number 74 will be out of sight from the Earth for approximately 28 or 48 minutes. Coming up in 2 hours and 16 minutes on the transearth injection burn behind the Moon during - at the end of revolution number 75. To repeat the ignition time currently is ground elapsed time of 236:42:08.

PAO A burn of 3046.9 feet per second to boost the spacecraft out of lunar orbit and on a trajectory toward Earth. A splashdown in the South Pacific Tuesday afternoon. The spaceflight meteorology group of the national weather service said this afternoon that weather conditions are expected to be satisfactory for the landing and recovery of Apollo 17 next Tuesday. A weather forecast for the planned landing area which is located about 350 miles southeast of American Samoa calls for scattered to broken clouds, winds of 10 knots, three foot seas and temperatures near 81 degrees. Members of the white team of flight controllers are beginning to drift in for the hand over just prior to acquisition of signal next revolution. We're estimating a change of shift press conference at approximately 4 p.m. in the small briefing room with the off going flight director Neil Hutchinson. To repeat estimated change of shift press conference at 4 o'clock small briefing room Houston News Center. At 234:26 this is Apollo control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/16/72 GET 234:28 CST 15:21 MC890/1

PAO This is Apollo Control again at 234:28. Scrub that last estimate of a change of shift briefing and back it up to 3:45 P.M. Repeat 3:45 P.M. in the small briefing room in the Houston News Center, with Flight Director Neil Hutchinson. At 234:28, this is Apollo Control. Out.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/16/72 GET 234:48 CST 15:41 MC891/1

PAO This is Apollo Control at 234 hours 48 minutes.
We'll be regaining radio contact with Apollo 17 in about 20 minutes.
The change of shift press briefing is ready to start momentarily in
the MSC News Center briefing room. We'll switch you to the brief-
ing room at this time.

END OF TAPE

PAO This is Apollo Control at 235 hours 8 minutes. Now less than one minute from regaining radio contact with Apollo 17. And, when once again we hear from the crew, they should be in the midst of eating their last meal in lunar orbit. Everything is in very good shape for the trans-Earth insertion maneuver to be performed at the end of this revolution, and at the beginning of the 76th revolution as they come around the front side of the Moon, they'll be on their way back to Earth. During this front-side pass, we'll be passing up to the crew the final set of numbers that'll be fed into their computer targeting the trans-Earth injection burn. Also, we have the times for acquisition of signal following TEI. With the normal TEI burn, we would expect to acquire signal at 236 hours 55 minutes. If for some reason, the burn is not performed as planned, we would regain radio contact at 239 hours 7 minutes 18 seconds. And, we should have AOS momentarily.

PAO I wanted to make one correction to the AOS times there. Without the burn, if the transEarth injection burn is not performed, the acquisition of signal time is 237 hours 7 minutes 18 seconds rather than 239 hours, as we gave you. Again those times. With the burn, 236 hours 55 minutes; without the burn, 237 hours 7 minutes 18 seconds. That would be about 12 minutes 18 seconds later if the burn is not done.

PAO We've got good solid telemetry from the spacecraft.

CAPCOM Hello, America, Houston. Over.

SC Hello, Houston, how do you read America? Over.

CAPCOM Okay, this is Houston. You're loud and clear on your last time around. Over.

SC Okay, Gordo, you're loud and clear. We thought we'd lost you there for a little bit.

SC And, we're just finishing up an eat period, and looked around, and the spacecraft still looks good on board.

CAPCOM Okay. Sounds good.

SC Got some gyro torquing angles, if you'd like them, please.

CAPCOM Okay, go ahead.

SC Okay, the last P52 produced gyro torque of minus 011 minus 007, and minus 002. GEP torque time was 2342607. And, let's just let it suffice to say we torqued on the Commander's P52.

END OF TAPE

SC Houston, Houston.
SC Houston, 17.
CAPCOM Go ahead.
SC Yes, Gordy. Gene was trying to call you guys for about 4 or 5 minutes after we had fairly good uplink signal strength and you didn't answer, until you said that was the first time you'd called. Is that something that you can explain down there?
CAPCOM I think it is, but let me make sure I get the right answer here.
SC We did not change any configuration in the spacecraft during that 5 minutes.
CAPCOM Roger.
CAPCOM America, Houston. I guess we don't have an explanation. We checked with the site. They were locked on and I can't see any reason why, if you were coming down that we didn't hear you.
CAPCOM America, Houston. You read now?
SC Oh, that's affirm, Gordy. Sorry I, we were discussing whether or not we had really transmitted. Apparently we had.
CAPCOM Okay. We'll keep checking here, but first glance doesn't turn up the, any answers.
SC Okay. Well, after the next run, we would like to have COMM if it's possible and that's what I was checking on.
CAPCOM Roger.
CAPCOM America, Houston. We're ready with all the updates, both verbal and electronic, whenever you are.
SC Okay. Stand by a few please.
SC Houston, you want the computer.
CAPCOM That's affirmative. We're ready with the uplink.
SC Okay, you've got ACCEPT now and stand by on the updates.
CAPCOM Okay.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/16/72 CST 16:19 GET 235:25 894/1

CAPCOM America, Houston, the uplinks in there
you can go back to block.

SC Okay.

SC Okay, Houston, we're ready to take final
TEI pad from you.

CAPCOM Okay, Jack here's the numbers you've been
waiting for. TEI rev 75 SPS/G&N 36 372 plus 063 plus 086,
NOUN 33 is 236 42 08 35 plus 30398 minus 01850 plus 00661.
Attitude is 180 000 000. NOUN 44 HA is NA. HP is a plus
00228 delta-V total is 30461 225 30285 sextant star is 06
1095 300. Boresight star is NA. NOUN 61 is a minus 1787
minus 16600 10474 36172. GET for 05g is 304 18 32. GDC stars
are Sirius and Rigel 136 071 035. Allage is 4 jets 12 seconds.
And three remarks number 1 is single bank burn time is 229.
Number 2 post TEI RCS delta-V is equal to 173 feet per second.
And number 3 remark is the SPS TU aux flow valve decrease
and then control as required. Over.

SC Okay, Houston here is your readback.
TEI 75 SPS/G&N 36 372 plus 063 plus 086 236 42 08 35 plus
30398 minus 01850 plus 00661 180 all zeros and all zeros.
HA is NA plus 00228 30461 225 30285 061095 300 boresight star
is NA minus 1787 minus 16600 10474 36172 3041832, Sirius and
Rigel 136071 035. The ullage is 4 jets for 12 seconds.
Remarks 1 single bank burn time 2 plus 29, two post TEI RCS
delta-V is 173 feet per second, and three the SPS TU aux
flow valve will start in decrease and then control as
required.

CAPCOM Okay, that's a good read back and I have
another one of those for rev 76.

END OF TAPE

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SC Okay, go ahead.

CAPCOM Okay, it's TEI 76, that'll be SPS/G&N. Weight is 36372 plus 063 plus 086 238 42 0762 plus 30799 minus 02837 plus 00048 180 359 358 all the rest of the pad is NA. G&C stars are Sirius and Rigel. 136 071 035 4 jets for 12 seconds. The remark is burn attitude based on TEI REFSMMAT. Go ahead.

SC Okay. TEI 76, SPS G&N 36372 plus 063 plus 086 238 42 0762 plus 30799 minus 02837 plus 00048 180 359 358 rest of pad is NA. Sirius and Rigel. 136 071 035 ullage is 4 jets for 12 seconds and the remark is burn based on TEI REFSMMT.

CAPCOM Okay, and one more is a map update. It goes on flight plan opposite 236 hours and 50 minutes on the right side of the page.

SC Okay. 236 50, right.

CAPCOM That's affirmed.

SC Go ahead.

CAPCOM Okay, the AOS without burn 237 07 18 and the nominal good TEI AOS will be 236 55 00. Over.

SC Okay, AOS without 237 07 18; AOS with 236 55 00.

CAPCOM Okay, Jack, we're getting pretty good with these pads, another 3 days we ought to have it down pat.

SC I think so, Gordy, is that an offer or do we have a choice.

CAPCOM Okay. Yeah.

SC I presume you meant three days around the Moon didn't you?

CAPCOM No, no, three days to splashdown.

SC (laughter) It's alright, Gordy, I know what you meant.

CAPCOM We got a lot of parties planned they don't want to put off.

CAPCOM Okay, we'd like the high gain on AUTO. And also, EECOM would like the H2 fans reconfigured. No. 2, OFF; No. 1, ON. Over.

SC Okay. Asbury comes request, H2 fan 2 is OFF and No. 1 is ON.

CAPCOM Okay, and we've taken another check on the problem with AOS this rev. We have several sites confirm that they had a solid downlink signal strength and that none of them heard you. We're wondering if you found anything in audio panel configuration possibly that would explain it. Over.

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SC Gordy, no, but it's conceivable, I could have been keying the intercom. I don't think so but it's certainly conceivable. I - I checked everything else around here.

CAPCOM Okay, Gene. You're loud and clear now so guess we'll let it go at that.

SC Ah, Houston, this is command module pilot, do you read me now?

CAPCOM That's affirmative. Loud and clear.

SC Okay, I'm on the AUTO panel that Gene was on when he first transmitted.

CAPCOM Sounds good.

SC Okay.

SC And Houston, Delta V test is minus 22.2.

CAPCOM Roger.

END OF TAPE

SC Okay, Gordo, this is America. Are you ready for the mapping camera?
CAPCOM Roger, Geno, standby. Okay, we're ready.
SC Okay. Okay, mapping camera is off.
SC Okay, mapping camera is standby, and image motion is off.
CAPCOM Roger.
SC Houston, I'm going to -- I'm waiting your cue to check out the number 2 pressure indicator.
CAPCOM Okay. Stand by, Jack.
SC I'm on SPS, of course.
CAPCOM Okay, Jack, we're ready.
SC Okay, Gordo. We're going to go ahead and maneuver. P30 looks good. The pyro service flag is reset for VERB 49.
CAPCOM Roger.
SC Okay, Houston. Then I'm going back to number 1 on the pressure indication.
CAPCOM Okay, we watched it.
SC And, Houston, America. The (garble) test went from plus 100 to plus 100.5. And went from minus 100 to minus 99.5.
CAPCOM Copy, Jack -- Ron.
SC Okay, what's our Delta VZ? 302815.
SC Aw, come on there.
SC Okay, Delta VZ is set. 3028.5. Ought to be in standby.
SC Okay, we're caged, rate temp? Okay, we'll put all 16 of them on. Down, up, up, down, up, down, down, up. We're CMC in AUTO and DET is set.
SC Okay.
SC Houston, America. We'll pick up the star sextant check and set the (garble) attitude.
CAPCOM Roger.
CAPCOM America, Houston, with some words about the pan camera operation after TEI.
SC Okay, go ahead.
CAPCOM Okay, we haven't talked about this, but we noticed a failure during the last operation of the pan camera of the Stereo. It's completely failed and, so, when you go to OPERATE, which is about 7 minutes after AOS after TEI, you can expect to get a Barber Pole after three frames have cycled through. Want you to just ignore that and let her run. We figure you have two minutes of film left, but we won't be able to monitor in the film because you'll be on TV on the FM, so we're going to limit the pan camera operations to 5 minutes total, and we'll be able to give you the mark when to turn if off after the 5 minutes. Over.

END OF TAPE

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SC Okay, Gordo. At 237 in the Flight Plan, where it's pan camera operate, we'll ignore the barber pole. We'll run for 5 minutes and we'll shut it down on your cue.

CAPCOM That sounds good.

SC Okay, Houston. The pan camera is going to boost. And also we're presently configured with the IR on and the cover open. Apparently Flight Plan neglected to have us turn it off, or are we supposed to burn with it open.

CAPCOM Let me check that.

CAPCOM America, Houston. We'd like the IR cover closed, to keep the Sun out of it.

SC Okay, and you want the instrument off?

CAPCOM Negative. Leave the IR on and I, I'll get back to you in a minute on all these covers.

SC Okay, Gordy. Cover's closed and we'll wait your further word.

CAPCOM America, Houston. On the covers, we want all three covers closed, according to the pre-SPS burn cue card. The instruments, the IR and UV, keep running until after TEI, when you open the covers back up per the flight plan. Over.

SC Okay, we'll do that and going OMNI Delta.

SC Houston, our last view this time around is the Sun rising over the Aristarchus Plateau and with the (garble) rilles and generally continuation of the striking views we've had up to now.

CAPCOM Roger.

SC We'll leave this country this part of this planet for the next group to explore, I guess.

END OF TAPE

CAPCOM America, Houston. I think this is what you wanted to hear you're go for TEI.

SC Outstanding.

SC Okay, Gordo understand America is go for TEI and I'll give you a confirm on the star here in just a second.

CAPCOM Okeydok.

SC Say Gordo I've got the moon now (garble) in the telescope be just a little bit before I can give you a confirm on that, but the dap is set.

SC Okay, we'll go ahead and go into P40.

SC Houston 17.

CAPCOM Go ahead.

SC Gordie, could you give me a summary of what your expectations are on the operation of the PUGS.

CAPCOM Okay, just a minute.

CAPCOM Jack, Houston, we expect you'll need decrease throughout the whole burn. However, we'd like you to control does require to keep it in a green band.

SC Okay, and why do you expect that, Gordie? I missed one of the burns.

CAPCOM Just the way it's worked from past history. That's what we expect this time.

SC Okay.

SC Okay, Houston we're down to six minutes in the checklist except for the star sextant check.

CAPCOM Okay, Gene.

CAPCOM Jack, Houston, with a further word on the PUGS. We have noticed after ignition on previous burns some oscillation. We suggest you stay in decrease for the first 25 seconds or so, till it stabilizes before you start controlling it.

SC Roger, Gordie.

SC Houston, the star sextant check is go.

CAPCOM Roger.

CAPCOM America, Houston, about 2 minutes till LOS. One reminder about the DSE we'd like you to go to low bit rate just prior to LOS as per the flight plan. And then go back to high bit rate at 6 minutes prior to ignition per your burn que card and you can just leave it in high bit rate from there on through AOS. We just went around the room once more everything looks good. Have a good burn and we'll see you and the TV picture as you come out the other side. Over.

SC Okay, Gordie, thank you. We're looking forward to a good burn. And, we'll see you coming out the other side.

PAO This is Apollo control. We've now had loss of signal. Apollo 17 completing it's last full revolution of the Moon. Flight director Chuck Lewis has just advised his flight controllers this would be a good time to take a 10 or 15 minute break and then be back on the consoles ready for acquisition of signal at which time Apollo 17 should be on its way back to Earth. The final set of numbers passed up to the crew to perform the transearth injection burn are very close to those that we had earlier. A couple of very minor changes. The ignition time is 236 hours 42 minutes 8 seconds. That represents a change of one second. The total burn duration remains unchanged essentially at 2 minutes 25 seconds. And this will impart an increase in velocity to the spacecraft of 3046 feet per second and that represents a decrease of 1 foot per second over the numbers we had previously. Splashdown is targeted for a ground elapsed time of 304 hours 31 minutes 25 seconds in the Pacific southeast of Samoa. The targeted splashdown coordinates are 17 degrees 54 minutes south and 166 degrees west. The television picture as Apollo 17 comes around into acquisition of signal. We regain radio contact should be a very spectacular view of the lunar surface. The spacecraft at the time we acquire should be at an altitude of about 291 miles above the lunar surface moving out at more than 55 hundred miles per hour and it will be almost directly over the crater Tsiolkovsky which is on the lunar farside normally not visible from Earth. This will be the second time that we have - -

END OF TAPE

PAO This will be the second time that we've had a chance to view the lunar far side via television from Apollo mission. The first time occurred on Apollo 10. We were discussing that mission with the Commander of Apollo 10 Gen. Tom Stafford, who's here in the Control Center. Stafford also recalled it being a very spectacular view, as all lunar crews have reported. One thing he did point out is that Apollo 10 had significantly more velocity at transearth injection than Apollo 17 will have. Had a shorter trip time of something like 40 hours for the return compared with about 68 hours for the return time on Apollo 17. This would perhaps cause the Moon to shrink a little less rapidly than we recall it from Apollo 10, but nevertheless, should be a very spectacular sight. The previous crews have described it, the Moon is looking as if you were in a high performance jet aircraft going straight up and the Moon goes from filling the TV screen to shrinking into a discernable sphere. A relatively short period of time. A matter of 10 to 15 minutes as we recall. Again, the acquisition of signal time, the time at which we should have radio contact with Apollo 17, given a normal TEI burn is 236 hours 55 minutes. We have a clock in the Control Center, counting down to that acquisition time. We're now 28 minutes 14 seconds from acquisition. If, for some reason, the transearth injection burn was not performed, we would acquire about 12 minutes later at 237 hours 7 minutes 18 seconds. This is due to the fact that without the burn the spacecraft remains in a lower orbit, does not clear the lunar horizon and become visible to antennas on Earth as soon. Everything has continued to progress very smoothly leading up to transearth injection. On the last front side pass, we sent up the final numbers to the crew. They made the final checks of their guidance and navigation equipment and as they went around the corner of the Moon, everything was looking absolutely normal. We did have one minor unexplained situation occur at the start of the revolution. Gene Cernan reported that he tried for 4 or 5 minutes to establish radio contact and apparently not getting through. The instrumentation communications officer here in the Control Center checked with the various tracking sites, both the prime and backup sites, and they all confirmed that they had not heard downlink from the spacecraft, although we did have, that is, voice downlink, we did have good telemetry lock on and good solid signal strength. The indications that we had, both on the ground and from the spacecraft were that everything was in the normal configuration and we simply have no explanation for that 4 or 5 minutes when the crew was unable to contact us. But the communications equipment has continued to work absolutely normally. No sign of any problem and no concern. This burn of course is performed while the spacecraft is behind the Moon, so we have no data on the maneuver. We'll

PAO get our first report of it as the crew comes back around on the lunar front side. Comparing this transearth injection maneuver burn with previous burns, it's interesting to observe the Flight Controllers. They're certainly all aware that this is a significant event, leaving the Moon for the final time in the Apollo Program, but the atmosphere here in the Control Center is not much different from previous transearth injection burns that we've observed. Having watched the spacecraft and crew perform this same maneuver flawlessly seven times previously, there's obviously less of the tension that was evident at this time after Apollo 8, when Apollo 8 was preparing to leave the Moon four years ago. We have a number of small clusters of people gathered around in casual conversation and in about 5 or 10 minutes, I'm sure we'll see everyone returning to consoles, getting set to receive that first data from the spacecraft. We're now 12 minutes away from the time at which the crew will be igniting their 20,500 pound thrust service propulsion system engine for 2 minutes and 25 seconds of what's been described as a rather stiff kick in the tail for the spacecraft. It's starts it on it's path back to Earth. And we're now about 25 minutes from reacquiring radio contact with Apollo 17. At 236 hours 31minutes, this is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control at 236 hours 52 minutes. We're now a little less than 3 minutes away from the time we expect to regain radio contact with Apollo 17. And, at that time, we should get confirmation from the crew that America is enroute back to Earth. We have another clock counting here in the Control Center for the acquisition time that we can expect, if the Trans Earth Injection burn was not performed, and that now shows 14 minutes 42 seconds until acquisition of signal. That again is the time that we would acquire if the Trans Earth Injection burn was not done as planned. We have an interesting display at the present time which is called up by our Flight Dynamics Officer, and this display shows what the computers here in the Control Center predict that the current velocity of the spacecraft and its altitude are, based on the assumption that the burn was performed as planned. And, if that assumption is correct, Apollo 17 at this time is traveling at some 7800 feet per second and is at an altitude of about 237 miles above the Moon and climbing rapidly. And, we're now less than 1 1/2 minutes away from acquisition of signal.

PAO We're now less than 30 seconds from acquisition of signal. The next call will be INCO's, the instrumentation and communications engineer letting us know that we have radio signals from the spacecraft. We'll be receiving Apollo 17 through a 210 foot dish antenna at Goldstone, Calif.

GOLDSTONE AOS, Goldstone.

PAO We've acquired signal, but we're still waiting for a good solid lockup. And, our data shows that Apollo 17 has an altitude now of 335 miles above the lunar surface.

CAPCOM America, this is Houston. We'd like the high gain, please.

PAO And, we're beginning to get a picture of the lunar surface.

PAO This view's from 400 miles up.

SC Houston, do you read America?

CAPCOM Affirmative, America. And, we have a picture. Over.

SC Roger, Houston. America has found some fair winds and following seas, and we're on our way home.

CAPCOM Okay, that's great news.

SC It sure is, Gordo.

SC You betcha, by golly. It's outstandingly good. That was a good burn, too. We'll give you the burn report in a bit.

CAPCOM Okay.

SC Okay, Houston, I'll try to give you what Tsiolkovsky saw about the nadir.

CAPCOM Roger.

PAO The crater Tsiolkovsky on the lunar far side is normally not visible from Earth. First seen by a Soviet Luna, an unmanned photographic mission.

SC There you go.

PAO That crater's about 160 miles in diameter.

SC This is a grand place to be right now.

CAPCOM I'll bet it is, and we've got a great picture of Tsiolkovsky. Got it right in the center, and good focus, great picture.

SC I know there's not as many smiling faces down there as there are up here, but we're making up for the difference in numbers.

CAPCOM Roger.

PAO America 500 miles above the Moon now.

SC Gordo, I'll give you a quick burn report.

The burn was on time. Burn time was 2 minutes and 23 seconds.

Delta VGX was 30470. Attitude at the end of the burn was

184005359. That's 184005 and 359. There was no trim.

The residuals are minus 2 plus .7 -- correction, minus .2 plus .7, and plus .2. Delta VC was minus 18.1.

CAPCOM Roger, we got those.

END OF TAPE

SC And Gordy, the unbalance is about 30 pounds, and oxidizer is 2.8 and fuel 2.9, and I drew full decrease the whole burn.

CAPCOM Roger, Jack.

SC How'd the picture look, Gordy?

CAPCOM Real fine.

PAO This view looking back across the lunar far side at the highlands.

SC I'd tell you exactly what we're looking at, but I can't see it.

SC Gordy, the country Gene's pointing out is south of the orbit that we've been following for several days, and Ron, even more than Gene and I. And it's some of the striking country of the far side of the Moon that human beings don't very often have a chance to see, but a trend's been started in the last few years, and I suspect it will continue.

CAPCOM Roger, Jack.

SC Gordy, America performed superbly.

CAPCOM America, Houston. We need pan camera OPERATE now.

SC Thank you. Pan camera going to OPERATE.

CAPCOM And can you verify that you got the other SIM bay items that precede that?

SC We're verifying that right now.

PAO The spacecraft panoramic and mapping cameras are both operating at this time to record this view of the lunar far side.

SC Okay, Gordy. The SIM bay should be squared away.

CAPCOM Okay. Thank you.

SC Mark our fullness there. Gordy, I'll try and take you across that terminator if I can.

CAPCOM Allright.

SC We're seeing country south of Tsiolkovsky that we've never seen before.

CAPCOM Roger.

SC And when we get a picture of Tsiolkovsky back, I think maybe even you can see one of the things that both Ron and I have noticed about it. Number 1, it's a basin that is comparable in it's freshness and apparent age to the probably the Imbrium basin on the near side of the Moon, and secondly, it has an unusual area in it's northeast quadrant that, from which, the blanket is excluded. There is an apparent slide, we're not sure what it is, but the normal indications of an ejecta blanket are just not there.

CAPCOM Roger, that Jack and we can see those features you just described. The camera, can you figure out a way to hold it a little steadier, that would help, but we're getting good resolution.

SC Okay, Gordo, I'm working on it. You'd think a guy that's been there for however many days we've been there, could find it don't you?

SC When you see Tsiolkovsky south, the central peaks form an arrow that points south, Gordy.

PAO If you look closely at the northeast rim of Tsiolkovsky, you'll see a large landslide that Al Worden first described on Apollo 15. Crew now moving the camera, apparently to a different window. Apollo 17 now at an altitude of 825 nautical miles.

CAPCOM America, Houston. Your altitude right now is 835 miles. Over.

SC Okay, 835 miles. And climbing out like a ding bat.

PAO North is now at the bottom of this picture.

SC Hey, Gordy, we're taking on mag Papa, Papa data altitude.

CAPCOM Okay, Ron.

SC There's Smythii down there. I finally figured out where we are. Right down underneath the window. I can see it now.

SC Gordy, as far as we can, we'll try to run you a little bit along the orbital track. I'll be panning the camera, more or less, westward. Tsiolkovsky starting and Tsiolkovsky is itself in the crater Fermi and moving on to the east, the next big pair of craters that we spent some time studying is Hilbert, which is just south, is right there, and just a little bit northwest of there is Pasteur.

CAPCOM Oh, Roger, Jack.

SC Both Hilbert and Pasteur appear to be very old basins, much older than Tsiolkovsky and they have, as you can see, a fill in them, apparent fill of very flat looking at this distance, and very light colored. It's an event on the Moon, of which we have a relative little understanding at this time, but possibly the Apollo 16 results, when they're fully known, with the analysis of the samples and other data, may shed some light on that event.

CAPCOM Roger. Sorry to interrupt, but we'd like pan camera OFF now. Pan camera on standby rather.

SC That's a full circle.

SC Okay, standby.

SC Now we're going to be able to pan a little bit more east now of Pasteur and start to show the crater Smythii, the basin Smythii really. It's one of the older large basins on the Moon. It has none of the obvious features of big basins, such as Imbrium or Serenitatis. But it's nevertheless roughly circular, has a mare fill, and a very, I'm pointing right now to the hint of a second ring outside, but the main ring is the one Ron's talked to you a lot about and has his ...

END OF TAPE

SC But see, the main ring is the one Ron's talked to you a lot about, and has this double ring craters in it. And we're pointing to some of those right now.

SC Ah huh.

SC Okay, Houston, we can now see Tycho. We're seeing probably about 75 to 80 percent of the entire Moon. Face, anyway lit up. The rings at Tycho are very obvious from here.

SC Want the camera over there, Gene?

SC Let me show it to him.

CAPCOM We had a good tour there of Smythii. We recognized the Smith Brothers, the Wright Brothers and started to see Neper before you left it.

PAO This view from the Moon at an altitude of more than 1000 miles.

SC Yeah

SC Yeah.

SC No you won't to see Tycho for a little bit.

PAO The large crater in the far right corner is the crater Humboldt.

SC You can - Langrenus is now visible at the edge of Fecunditatis there, if you want to show that one.

SC It's this side of Fecunditatis.

SC And Humboldt is a crater that ought to show up very well on television. That's the cracked floor crater there with a little dark mare.

SC Okay

SC There's all the swirls in Marginis. You can really see it now.

SC Oh, yeah. Why don't you get

SC Yeah. Certain swirls ---

SC Okay, early in our orbit, particularly Ron, he had the chance to work on the question of these light colored swirls and Marginis has outstanding examples of 'em and I'll try to get the camera pointed on those in the northern part of Marginis. Let me orient you, as soon as we're focused here. Okay, Smythii, I'll point right at the center of Mare Smythii, and then move up towards Neper and then into the swirl area a little bit more north. And Gene will zoom you in and let you see what some of that looks like. I don't think we have a full answer at what the swirls are, but some of the things that we saw in Taurus Littrow and later from orbit around Skulpicious Galois may suggest to people from now on that the possibility of alteration from fluids in the interior of the Moon is more than just a possibility.

CAPCOM Roger. That's a nice shot there of Marginis.

SC Can you see the swirls, Gordy? Are the very diffused light colored areas that cross various topographic features?

CAPCOM That's affirmative, Jack. They're visible from here.

SC Okay. I'm going to give you an end on view, if I can, of Mare Crisium Basin. You should be seeing that now.

CAPCOM That's a good picture of Crisium as it is very evident on the right side of our picture.

SC Yeah, that's right. And before long we'll be able to show the landing site and Taurus Littrow and I think you probably see Proclus which is the bright crater just off the horizon now. That's the one with the excluded ray zone on it's western south western side. It's not in view yet.

SC We may not see it, I think we're going the other way, right in the horizon.

SC The landing area, Taurus Littrow, and the edge of the Serenitatis Basin is probably just on the horizon now and I'm not sure it -

SC You can see the dark part of Serenitatis is sticking out of the Sea of Proclus the (garbled) zone. No that's Fecunditatis sticking up there, isn't it? Because the ray is perpendicular to our track now. Points right to the landing site right off of Proclus.

SC The area where one of the Russian vehicles set down and returned sample from is just about in the center of your field of view now. Just on the north side of Fecunditatis.

CAPCOM Roger, and you're about 1300 miles up right now.

SC Wow. That's not a bad climb is it Gordy?

CAPCOM Pretty good rate.

SC A friend of mine says "Wow Woozle."

SC Looking out the window of window 3 now the Moon is just the size of the window and I've got my face right up against the window.

SC Or maybe his head's just the size of the Moon. We're not sure which.

SC (laughter) That's right.

SC I don't know what's happening down there now Gordy, but this is where the action was one time.

SC Okay, we're starting to, I think, in a little bit be able to show you the edge of the Serenitatis Basin. It's moving a little slowly right now. It look like it's creeping over the horizon.

SC It's going to creep over the horizon
maybe but I think -

SC I'll tell you what's on the horizon
now. I'm not sure I can get it. Let me try the rendezvous
window. I think I can show 'em Apollo 11's landing site.
You can probably get it in the south portion of Tranquillity
there, if you - out the center window would be better.

SC Yeah, the center window you could get it.

SC See the southern part of Fecunditatis
and then the Tranquillitatis takes off to the west there
Gene right along that southern edge of Fecunditatis is where
Apollo 11 set down.

SC Yeah, and a little bit north of the line
of the ray of those two there.

SC Okay, Gordy, in the center of your
picture is, about right in there, is the southern edge of
Tranquillity and the Apollo 11 area and that was the ground
track of course for Apollo 8 and Apollo 10.

CAPCOM Roger.

SC Yeah, we'll put you back on Langrenus
which is one of the Copernican age craters and it's part of
the Moon and I believe it's Apollo 12 that had an excellent
opportunity for several orbits to study Langrenus.

CAPCOM Roger, we see that. It stands out like
a beacon there on the right side of the picture and we also
saw Messier with its rays.

SC Okay, our landing site's in view now,
see.

SC You're a little bit off the field -
let me - almost out of the field unless we - Proclus, our
landing area is just about in the center of your field of
view right at the horizon now.

CAPCOM Roger.

SC That's the best focus we've got Gene.

END OF TAPE

SC Okay, full zoom, and right in that region in the center should be the landing site of Apollo 17. Known hereafter, I guess, as the Taurus-Littrow area.

CAPCOM You're now 1500 miles above the surface, and your climb rate was just computed at 295 000 feet per minute.

SC If I'd known that (laughter). That is really moving out. Sure glad they cleared the traffic out of the way. Let me -- Gene, let me switch over briefly and show them the North and South Poles, which nobody really has done much with yet, except lunar orbiters, and some of the Russian vehicles. There's a spectacular valley on the South Pole. I don't know the name. It looks like one of these long chain of -- chain of craters. Did that show up? He tried it. Try some of these others. Well, oh, here's where it goes. Okay, Houston, we're in -- Huh? Good picture? That's in the South Polar region. There's a -- I think you can probably see a long chain of craters, which so far unvisited by man. In fact, the whole region has, and that goes for the North Pole.

CAPCOM Roger, Jack. That's very interesting. Can you zoom in on that whole valley?

SC I think that's the best we got, Gordie. That's full zoom.

CAPCOM Roger.

SC It's one of the biggest crater -- chain crater valleys that I've seen on the Moon. It -- we saw some crossing Mindelaya in the first few days, I think we talked about. Similar in shape, but not nearly as big.

CAPCOM Roger.

SC Let me move over briefly to give you another view of Humboldt which should show up very well now. We're just about directly overhead. It's unusual -- one of the few craters on the Moon that have a fairly flooded floor, and appears to have been domed, and you probably can see some of the cracks in that floor.

CAPCOM Okay, it's in the center of the field now, however, something is blocking the right side of the view.

SC How's that?

CAPCOM That's real good now.

SC Around the edge of the dome floor, you can see some of the dark Mare which is prevalent elsewhere in the region but not so abundant in Humboldt.

CAPCOM Roger.

SC And, you -- you -- you can see -- if you can see -- (garble) Oh, okay.

SC Out the window.

SC Oh, all right. Hey, there's another view, if you will bear with us, of our old friend Tsiolkovsky. Okay?

SC Okay, I got it.

CAPCOM Roger. It's hard to mistake that one.

SC Yeah, it's one of the -- one of the more picturesque basins, I guess partly, although it's big, it's not so big you can't look at it all at once. Smythii and Crisium and Serenitatis and Imbrium, in particular, are hard to look at all at once. You're always down inside of them in a 60-nautical-mile orbit.

CAPCOM Roger. Just might mention the diameter for those watching at home. That's about 180 miles across, I think.

SC (Laughter) That's pretty good. I was going to say about 200 kilometers, I think, is what it is, but --

SC That's right.

SC And, Gordie, of course, it's on a part of the Moon that you -- you don't see from where you are.

CAPCOM Roger.

SC Not yet, anyway.

SC Okay, let's see if we can move on along our orbital track that we've been following and see what's new that's come into view. Once again, I'll pick you up at Smythii and move you into Mare Marginus, the Margin Sea. And, all the Mare, you may recall now, we have pretty good evidence as a result of the Apollo Program that our theories of basalt flows that some 3 to 4 billion years ago, in round numbers, were erupted on the Moon and filled many of the lower areas that existed at that time. Not an awful lot has happened to the Moon since -- except for the impact craters, some of the youngsters ones, since 3 billion years ago, which is one of the reasons it becomes so interesting to man. It's -- the Moon's frozen in a period of history 3 billion years and older, which is a period of history that we cannot recognize very readily on Earth because of the dynamic processes of mountain building and oceans and weathering that are taking place even at the present time. Understanding that early history of the Moon may mean an understanding of the early history of the Earth. And, I think we're well on our way to a first-order understanding of that history as a result of the program. Okay, going to take you a little bit farther along. Again, to Proclus, which is the obvious partially rayed crater with a big excluded zone to the southwest. There's Mare Fecunditatis and its contact area with the Sea of Serenity, Mare Serenitatis, and the landing site now has to be just about on the horizon. I think we were a little premature before.

CAPCOM Roger.

SC Yeah, we were. That's Microbus A and B just beyond Proclus there.

SC Yeah, that's really Microbius --
SC Now, you're starting to just to see
the Mare of Serenitatis come over the horizon.
SC Yeah.
SC And, if you take a line from Proclus
between the two bright craters, --
SC You're not going to get more of
the Moon unless we have space up here.
SC Yeah, yeah. How's that?
SC That's better.
SC Take that line, and that will take you
just about to the landing area, right at the edge of the
next big mare that you see.
CAPCOM Okay, Jack, we can tell them that just
as you told us there. Those three craters are very obvious.

END OF TAPE

SC The site Gordo is now just to the left and a little below center of your picture.

CAPCOM Roger.

SC And again you can see that ridge of mountains that sticks out and the landing site is - well from here right in that area.

SC Right, I guess my line was a little bit north of where we actually should have pointed you. There some dark area just showing up around the edge of Serenitatis on the horizon. I think that will show in your picture as I remember some of these from Apollo 10 before. And, it's just this side of the dark area that the Taurus Littrow area sits, in the mountains there.

CAPCOM We think we have Miraldi in site now.

SC Yes, and you also (garble) Macrobius should be visible to you just to the south of the landing area.

CAPCOM Macrobius is in the monitor still they should have it.

SC Jack, I think a good view you can see Senserinous now you can probably get a real good shot of the eleven site at (garble).

SC Yes, your right. There Sensurenous. It's awful big.

CAPCOM How big is it, Geneo?

SC Okay, north the seven border. (Laughter). The old Sensurenous is right in the middle of the screen.

CAPCOM We see it.

SC You've been there before.

SC Right.

CAPCOM 17, Houston, you just past 2000 miles.

SC 2000 miles. We've got about a 95 percent full full in front of us. Not too far, matter of fact, I think the Apollo 16 landing area would be just about on the horizon to the south of Tranquillitatis. And back up to something that's dear and near to our hearts. You probably now can pick out the mountains the north and south massif if you really look closely.

SC (Garble) is in the monitor can they see that.

SC I can't even see the massifs with the naked eye, no.

SC See the dark area there next to -

SC I know where to look, but it's so hard to pick them out. But, your looking right at it. You've got it right just to the left center. It's just about perfect the landing site. There's a little dark area in that

SC peninsula mountains that sticks out and the site is just about right in that area.

CAPCOM Roger, Gene as you say we know where to look, but it's hard to confirm exactly the structure there.

SC Come on you guys I can even see the light mantle.

SC Extrapolation is the nature of our art.

CAPCOM I just saw a flash, Jack.

SC We think it's (laughter). I didn't hear them. Say again.

CAPCOM I just saw a flash.

SC (Laughter). I wish we could show you some of the color we see on the Moon this trip, but I think we're a little too far away from it. We'll see if we can (garble) back in (garble) from here.

CAPCOM (Garble).

SC Well, I can show you a picture of the commander. He's fairly colorful.

SC That's probably what we're seeing, Gordie. I can't give you the bottom halves because I can't quite move around the post here.

CAPCOM Geneo, we're getting a great picture (Garble) 80 percent of it.

SC You getting the whole movie? Okay, I think you can orient yourself with the big basins, Jacks been talking about. There's Crisium. You can see the landing site up in the - what is to me the upper left hand corner of the picture, but you can pick it up by now I know. Get a better relationship. Your looking at the Langrenus down there that bright crater. You ought to be able to see Humboldt. Maybe Jack can give you the whole thing. He can give you the whole thing.

SC Yes, (garble). Ah, okay that's pretty good it's centered just about right in the center. It ought to fit your screen as we climb out. Just about tangential now.

CAPCOM That's perfect right where you got it.

SC Okay, we'll hold that for a minute. The terminator is going to cross of course at the opposite side of the Moon from the big basin your looking at.

CAPCOM Roger. Geneo, what color does that mare look like to you.

SC What color does the mare look like to me from here?

CAPCOM Right.

SC Now I'm a commander do I have the right to change my mind? (Laughter).

CAPCOM I guess so.

SC Tom, you know I always thought you could almost make it look whatever color you wanted to it's so subtle. But the mare - the mare to me has got a grayish - a dark garyish mixed with a very subtle tan and that's what it looks like to me from here.

CAPCOM Roger.

SC This is the CMP. I agree with that.

SC The tan is sort of like a dusted tan in spots in and around and on the mare. I said at the basic if I could pick out a chunk of that gray mare from here. I would pick out a very steel gray. A dull steel gray color, but if I just took a massive mare out I'd have to mix it with a subtle - very very subtle pastel tan.

SC That's perfect. You can see Tsiolkovsky now in the terminator down there. I think Jacks just about got the Moon centered perfect. You got Tsiolkovsky on one end and the big basins on the other end. How high are we Gordie.

CAPCOM Okay, your 2327 miles.

SC You know I think it worth noting while we're looking back at the entire Moon as we see it here and your seeing it there that America could be proud of the Apollo heritage it's left here. I know we in the program believe that it's really and truly been a heritage will prove itself to be one of mens most beneficial things that have happened to mankind in quite some time, although none of us can really predict the future. But I think everyone that has been part of this program has been taught of its accomplishments. I know we have. We're looking back at someplace, I think, we will use as a stepping stone to go beyond some day. And those ardent words. Its a faith I truly and dearly have. And, I think we will all see it in our lifetime not just as a nation, but as a world. I think the Apollo program not only has given us the first step to that sort of impossible dream, but has given us an opportunity to make the first step in bringing a world together as one unit so that we can make that step together. It's been a priviledge sharing the program that part of it that we've been in with as many people as we have and as many people as we can because I've often thought and I've often said before that anything that's worthwhile doing and doing well is certainly worthwhile sharing with others. This is history being made in our time while you and I are alive not a hundred years ago or a thousand years ago and it's sort of the real thing happening right now. You're living it not just us. We hope that your getting as much out of it not just feeling of pleasure and excitement but that of accomplishment as we are.

end of tape

CAPCOM Thank you, Gene. Speaking for the ground, as part of the Apollo Team, we second those thoughts, which you put very well.

SC Well, Gordy, it's not our accomplishment. It's the accomplishment of the nation. And I think the next set of accomplishments, apparently the accomplishments of mankind. Gordy, in, in that vein, I think a couple words, I'd like to, more or less, reiterate what I tried to say as we finished our third EVA and that was that the valley of Taurus Littrow and the orbit of the spaceship America, saw the completion of mankind's first steps, first evolutionary steps from the planet Earth into the Universe. I think it's important that in doing so, he established a tradition of peace and freedom within the solar system. From that larger home now, we move to greet the future.

SC Hello Houston and America and the World, this is the Command Module Pilot of the spaceship America and I just feel quite honored and proud to have been a part of this Apollo Program. The Moon, itself, is a magnificent, I hate to use the word dynamic, not dynamic, but it's a marvelous planet. It has all the wonderful opportunity for exploration. Man must explore. We will continue to explore and I hope that some day we may all have the opportunity to see mankind enjoy the benefits of the exploration of the Apollo Program.

CAPCOM Thank you very much for the great TV show and the, and your final words. I enjoyed every bit of it.

SC And Gordy, with that, we're about behind our timeline as we fully expected we might be at this point and time, but believe me it has been a beginning, it is a beginning, I don't think there ever will be an end, not as long as man is alive and willing.

CAPCOM America, Houston. We didn't have data, of course, while you had the TV on. We're wondering if you configured the SIM bay on our voice call or had you done it earlier? Over.

SC No, Gordy. We were late. When you called, I guess pan camera ON, we went back and configured a SIM bay and followed those steps in the Flight Plan. That followed TV ON. We had not done that.

CAPCOM Okay. No problem. We're just, just wondered what we had there.

SC Okay, are we up to date on the SIM bay now. you set a final?

CAPCOM Well, we're just now getting some data, and taking a look. We'll let you know. Okay, we'll take pan camera OFF now.

SC Okay, the pan camera power is OFF.

SC Okay, Gordy. S-band AUX TV is going to science.
CAPCOM Roger.
SC Gordy, it's going to be hard to leave this
attitude, but we'll get the maneuver now.
CAPCOM Roger.
SC And Houston, America. Mag Delta Delta is empty
now. The last 50 per cent was used for taking pictures of the TEI.
CAPCOM Okay, Ron.
SC Gordy, going back at that burn. It was an
outstanding burn. We were looking about a half a G throughout
the burn. She lit off on time. She was a very steady burn. I
think she reversed roll a couple of times at the deadband. The
computer and the EMS were with each other all the way. Chamber
pressure on Bank A started out at about 87. Bank B brought it up
to about 92 or 93. And when I first sat down, it was reading 0,
now it's reading 5.
CAPCOM Okay, Ron. We got 6 down here.
SC Okay, so in all other respects, the burn was
nominal, Gordy. You got the burn report and residuals and we'll
leave the tracking to you.
CAPCOM Roger.
SC I might add, I don't think they built spacecraft
any better than they built these two.
CAPCOM I don't see how they could have.
SC I'll sure second that.
SC I finally found what I was looking for. I got
the man in the Moon.
CAPCOM Roger.
SC For all you non-believers, I verify he really
is there.
CAPCOM Okay.
SC Gordy, these next series of maneuvers bring us,
bring our middle (garble) to the apo. We're watching it, but appre-
ciate your not hesitating giving us a call, too.
CAPCOM Oky, doke.

END OF TAPE

SC Gordo, in answer to PP's question about the color of the maria down there when you look at Serenitatis, of course we saw this earlier, when we were much closer, but when you look at it from up here it's got on the northeast side, a very - quite thick laterally across the surface, dark - typically dark with the tannish colors I was talking about - mare - which sort of borders it, but just north of the overlap between Tranquillity and Serenitatis that contact changes sharply to a - the grays are gone - it's a very sharp contrast and I think those who have seen it before will remember it, but Serenitatis from where we stand is much more tan dominated than gray dominated.

CAPCOM Roger.

SC Gordo. I'll get those numbers out of the first state vector out of the computer here shortly, no hurry to do it though.

CAPCOM Okay.

SC Do you have our altitude now? About 4000 miles maybe.

CAPCOM I lost that display. Let me check it.

SC No, I'm just trying to relate it to when we were coming in. I'd say it's more like 5.

CAPCOM 3100.

SC How many?

CAPCOM 3100.

SC 3100. Okay.

CAPCOM America, Houston. Sorry to say that the LCIU has pretty well cropped evidently. We were talking over the biomed schedule and suggest that your choice either Gene stay on it or Jack go on it and then we'll get back to the flight plan rotation after the EVA. Over.

SC Okay, I'll stay on it through the EVA. How's that?

CAPCOM Okay, fine.

SC And we'll pick up Jack in the morning.

CAPCOM All right.

SC Gordy, this is Jack. I failed to see the correlation between the LCRU crumping and me going on biomed. Don't tell me you were monitoring it on the surgeon's console there.

CAPCOM Well, we don't see any correlaon either but we're trying to look for some.

SC Okay, let me know when you have an answer.

CAPCOM Okay.

SC Houston, America, when you get a hack on our track, I'd like to get a first good estimate at it.

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CAPCOM Okay, we'll do.
CAPCOM Do you know it'll take about an hour to
get a good hack. Take about that much tracking. However,
earlier the retro was betting everybody there wouldn't be
any mid-courses.
SC That's a good way to feel. Okay, we'll
talk to you in an hour about it.
SC Whose the wild man Retro? I don't want
to play poker with him.
CAPCOM (garbled) He's a former B-17 pilot.
Always right on.
SC Now you're starting to scare me.
SC You can pass the word to Captain Green
back there on the Tidings, "Clear the flight decks".
CAPCOM Okay, we'll do it.
SC The last time I had anything to do with
a bomber pilot, Gordy, was scheduling my airplane.
PAO This is Apollo Control at 238 hours
1 minute. During the -
SC America.
CAPCOM Go ahead.
SC We got PTC orientation in the computer.
CAPCOM Negative. But we got it ready to come
to you if you give us ACCEPT.
SC Rog.
CAPCOM Okay. It's all yours.
SC Roger.

END OF TAPE

PAO The significance of Capcom Gordon Fullerton's comment to the crew a few minutes ago that the LCRU had "crumped", as he put it, is that we're no longer able to get television from the lunar surface. The television picture comes back through the Lunar Communications Relay Unit. The Instrumentation and Communications Officer here has tried numerous times to command the TV on, and the commands are not getting through. So, apparently, the TV is no longer available to us.

SC Gordie, (garble) on the way back the only planet that really has much weather visible will be a little repetitive.

CAPCOM Uh, Jack, we're heartbroken.

SC For your for -- first report, you can just play the recording back. It's sunny and clear.

CAPCOM Okay.

CAPCOM You're right on that one --

SC The only time we need a weather --

CAPCOM -- except that you left out the fact that it's cold also here.

SC Gordie, you didn't listen. I can't see the Earth. I'm talking about that other planet.

CAPCOM Okay, depending on what part you're looking at, it's cold there, too. We got you though. You got your REFSMMAT, you can go back --

SC There might be traces of an atmosphere.

SC Okay, Gordie, we're in block, and I might give my CMP one more chance at a P52.

CAPCOM Okay.

SC Then, the LMP gets to start trying.

PAO P52 refers to the rather tricky job of aligning the stable platform, does require a fair amount of practice, and Gene Cernan threatening to take over the job, of course facetiously, if Ron Evans didn't get a good P52 on his first try. This is the stable platform used as a -- as an attitude reference by the spacecraft guidance and navigation system.

PAO By virtue of the fact that the television is not available to us, we were not able to see the third of the explosive charges fired. The seismic data indicates that that charge was fired very close to the planned time at 237 hours 49 minutes 52 seconds. That would be just a little more than 2 minutes early, and we're getting good seismic data on it in the Control Center at this time.

SC Gordie, I can look back and with the glasses -- the binoculars, and I can see the white mantle and see all the Massifs in the landing area.

CAPCOM How about that?

CAPCOM Back when you had the tube on it, I -- I really think -- I knew we were looking in the right spot, but it was just blurry enough that you couldn't be sure of exactly what you were looking at.

SC Gordie, let me -- since I don't have anything else to do right now, apparently, I'll see -- tell you a couple of things I see right here. The annulus -- the dark annulus around Serenitatis does not look complete in -- in the new north area. Oh, there're little partial pieces of dark material up there, but the main part of the annulus seems to cross into the Mare region that's north of Serenitatis, and I can't remember the name of that right now. But, it very clearly crosses right over there as a band and then dies out in that north region.

CAPCOM Roger.

SC Okay, Houston. There's the torque and angle.

CAPCOM Okay, we copy.

SC Okay, and I'll torque it -- it looks like, it's at 23810. Guess you really don't care, though, do you?

SC And, once again, albedo wise and hue -- color hue wise, the -- that annulus is the same as at Tranquility, and essentially the same as most of Fecunditatis. The areas -- although Tranquility and Fecunditatis are mottled (garble) with tan colors, that mottling seems to be local and, probably in large part, related to rays that cross those -- those seas.

CAPCOM Roger.

SC At this viewing angle, the dark mantle around Taurus-Littrow area is just a darker shade of blue-grey to me of the annulus, more just a medium grey, I guess, whereas the Sulpicius Galois dark mantle is a brown-grey, quite distinct in its color hue -- to me, at any rate.

CAPCOM Roger.

SC Houston, I can't see any stars out there, so I'm going to (garble) instead of (garble).

CAPCOM Okay.

SC Hopefully, the reason I can is because -- cannot, is because the Earth is right in the field of view, and it's still pretty bright.

CAPCOM Roger.

CAPCOM America, we've got a little musical selection for you here. Stand by.

Recording of Dean Martin singing "Going Back to Houston".

SC That's very appropriate. I remember that being played one other time after a TEI burn.

CAPCOM Rog. I think it came the other direction that time, didn't it?

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SC If you stand by, we'll express to you our
sentiments here with a short little tune I think you will enjoy.

CAPCOM Okay, standing by.

Recording of "God Bless America".

CAPCOM Hey, thank you very much. Very enjoyable
and also very appropriate.

SC It certainly has a twofold meaning for us.

END OF TAPE

SC That's about par for the CMP now.
CAPCOM Ho hum another all balls.
SC (Laughter) you hit it right on the money.
CAPCOM Okay, we've got those.
SC Okay, and we torque at 23823.
CAPCOM Rog.
PAO Ron Evans last comment referred to the platform alinement he just performed the so called P52 which came out perfectly no error at all. And, of course, he was referring back to the commander Gene Cernans previous remark that if the P52 did not go properly he would take on the job himself. This, of course, is a task that the command module pilot is most proficient at and has done the most training and preparing for.

SC Gordo, I'll maneuver in about 10 minutes.
CAPCOM Okay fine.
SC Hey Houston America.
CAPCOM Go ahead, Ron.
SC You reckon you'd have one of the photograph down there to figure out when we could get a full Moon with an 80 millimeter lens.
CAPCOM Okay, I'll put them to work on it.
SC Okay, appreciate it.
SC Houston, 17.
CAPCOM Go ahead, Jack.
SC On the pan camera you said to expect to see barber pole when we ran it. I did not see that just for your information. It went barber pole then gray.
CAPCOM Okay, thank you.
SC And Gordie several times I have reminded myself to tell you guys something and I keep forgetting. I think it was yesterday when we did an oxygen purge on fuel cell three after about oh I think it was a minute possibly a minute and a half. The high O2 flow warning was triggered. Normally, I did not trigger when we do the purge. That's the one and only time it's happened. This last one prior to TEI there was within the green band and there was no fuel fell caution and warning. Just thought you might be interested in that one.
CAPCOM Okay, Jack thank you.
SC Houston Ron here I think I got that on fuel cell 3 too in one of my fuel cell purges when I was up here by myself. Probably shows up on the data anyhow.
CAPCOM Roger.
SC And you can tell Farouk that crater out on Fecunditatis that I've got a picture of that we worked on back at the cape and studied quite a bit has got all the atquibets of everything he told me about it.

APOLLO 17 MISSION COMMENTARY 12/16/72 CST 19:13 GET 238:20 908/2

CAPCOM Roger.

SC Yes, and that's the one - that's the one
I was describing on this morning.

CAPCOM Okay.

SC Also, be advised the inner ring of the
basin Arabia is quite visible. It looks like there is a
shallow depression outside the inner ring and when you get
up at this altitude right around Sanger it is indeed it looks
like a raised up plateau crossing Sanger. And, also in the
vicinity of King - King is almost going into the terminator
now. Well, it's 10 or 15 degrees from the terminator. But,
you can see a little bit of a raised plateau that takes in
the crater King and goes about a crater a King crater a
diameter and a half or maybe two diameters to the south, and
a crater and a half to the north of King.

CAPCOM Roger.

END OF TAPE

SC You know, Houston, it's also interesting to note the range of color from this altitude and from 60 miles doesn't seem to change at all, really. In other words, the same impressions that I had of color in the 60 mile orbit are the same impressions that I have now of the same areas.

CAPCOM Okay, that's interesting. You're a little over 5000 miles out at the moment.

SC Roger.

SC Gordy, you don't have that number on this millimeter camera, do you. We're going to maneuver and I'd like to get a last shot at it.

CAPCOM Okay. Well, you're far beyond the point where you can cover the whole Moon with an 80. We were just trying to come up with an altitude for filling up the 250, but you'll get the Moon and then some with the 80 right now.

SC Okay. That's good. Then we'll take it with the 80.

CAPCOM Rog.

CAPCOM America, Houston. At 240:30, you'll be about 10 000 miles out, at which altitude, the Moon will just fill up the 250 lens field of view.

SC Oh, okay, 240:30, it looks like for the 250 lens.

CAPCOM Right.

SC Gordy, are you ready for an OMNI or you want to wait a little bit.

CAPCOM 17, Houston. Gordon's off the console for the moment. We'll wait a couple of minutes on the OMNI.

SC Okay.

CAPCOM America, Houston. We need OMNI Delta.

SC Okay, you've got OMNI Delta.

CAPCOM Okay.

PAO This is Apollo Control at 239 hours 15 minutes. It's been very quiet, both here in the Control Center and onboard America. The crew, at this time, appears to be on the nominal flight plan, and they should be in the midst of an exercise period at this time. Also, they have the scientific instrument module bay in the Service Module of the spacecraft pointed toward Earth, with the ultraviolet and infrared spectrometers gathering their first data on Earth from lunar distance. The crew is scheduled to begin it's sleep period about 3 hours from now, at 242 hours 20 minutes Ground Elapse Time. And at the present time, we show Apollo 17 6782 nautical miles from the Moon with a velocity of 4537 feet per second.

END OF TAPE

SC Houston, America.
CAPCOM Go ahead, America.
SC Looking at our sketches here and trying to figure out exactly what we're looking at in the dark part of the Earth, I guess it's you and if it's a clear night you ought to have a pretty full Moon looking back at you.
CAPCOM That's right we do. In fact it's nice and clear all day and I could see it as I came in this afternoon. Your subspacecraft point right now is over the Yucatan Peninsula.
SC Yeah, it's just about the chart I'm looking at, Gordy. Looks like about the right smack in the center.
SC Gordy, do you have a general trend on the prediction in the recovery area.
CAPCOM I haven't heard one, but I'll see if we can get one.
CAPCOM America, Houston. The sun is just about to enter the lens of the mapping camera and we'd like you to retract it and then close the cover. We're now copying SIM bay data now so we'd like you to get a mark on both the stata retraction - get a mark on the stata retraction and one when barber pole goes gray.
SC Okay. We're going to retract the mapping camera. 5, 4, 3, 2, 1, mark it. There barber pole. And that was at 22 30.
CAPCOM Okay, and we want to keep it running to run the film out.
SC Okay, understand.
CAPCOM America, Houston, how is the mapping camera talk-back look?
SC Barber pole.
CAPCOM Okay. We thought it should have been gray by now.
SC (laughter) Okay, let's see. I've got coming up on 4 minutes.
CAPCOM That's what I've got.
SC Hey, there we go. Great.
CAPCOM Okay, thank you.
SC Took awhile, but it made it.
SC Okay, the cover has gone closed, barber pole, gray.
CAPCOM Okay, thank you.
CAPCOM America, Houston. Got a couple of answers for you here. On the 02 National Warning Indication on the purge, the time you were pulling 37.8 amps out of chill cell 3 because the SIM bay was fired up, and that'll result in about a flow of 1.37 amounts per hour which -

APOLLO 17 MISSION COMMENTARY 12/16/72 20:10 CST 239:17 GET 910/2

and the triple of it is 1.2 so that's where you got the flag on it and you can expect to get the cushion warning any time you've got 33 amps or more being pulled out of the fuel cells at the time you purge. Over.

SC Okay, that sounds good then.

CAPCOM Also, we've tracked you a while now and mid-course 5 looks like a whopping .3 of a foot per second at this time.

SC Beautiful, Gordy, beautiful.

SC That's outstanding.

CAPCOM America, Houston. In answer to your question about the weather at splashdown, the area is right now 2000 scattered and 10, winds variable at 10 and forecasting the same, 2000 scattered and 10, with 3 foot waves, variable at 10 knots on the winds and some rain showers but less than ten percent coverage of the rain showers in the area. Over.

SC Ah, you're full of good news tonight.

Thank you.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/16/72 GET 239:34 CST 20:27 MC911/1

SC Houston, America is about to maneuver.
CAPCOM Okay.
SC Houston, 17.
CAPCOM Go ahead and give us OMNI Charlie, please while
you're talking.
CAPCOM We'd like H2 tank 1 fan off.
SC Go ahead. H2 tank 1 fan is OFF.
CAPCOM Thank you and go ahead.
SC Okay, we got all three of them off now. Right
Gordy?
CAPCOM That's affirmative.
SC Hello Gordy.
CAPCOM Hello, go ahead Jack.
SC Okay, since I can't help you out on the weather
right now in the Pacific. Can you give me a run down of what
things look like out there? Oh, I'm sorry. I wasn't on the loose.
Apparently you already briefed somebody on that.
CAPCOM I covered the Recovery area. Not the rest of
the Pacific. Did you want an overall briefing.
SC No. I was just curious what the Recovery area
looked like, and I'm sure that my compatriots will clue me in on
it, if I'm nice to them.
CAPCOM Yes. I'll save them the trouble. It's going
to be 2000 scattered, 10 miles, 3 foot waves, barely above 10 knots.
And less than 10 per cent chance of rain showers. And that's just
about what the weather is now, and also forecast.
SC Okay. Thank you very much.
CAPCOM Jack, you've got a lot of SIM bay data stored
up there, that we'd like to get dumped. Can you give us a high
gain, pitch 30 yaw 320?
SC Okay, pitch 30, yaw 320. Okay, it's the old
high gain for you.
SC Gordy, what altitude are we at now?
CAPCOM Stand by, I'll check. 8500 miles.
SC You clipped. Say again.
CAPCOM 8500 miles.
SC Okay.
SC Gordy, as we're maneuvering, I guess we got one
of the most spectacular views of the Moon I've ever seen, from a
position like this. It's like, just short of being 100 per cent
full. We can still see from Tsiolkovsky all the way across the Moon
and it's just absolutely magnificent and I'm afraid we're talking
here, that the pictures just won't capture the real three-dimensional
picture we're looking at. But, uniquely with the binocs I can still
see the Light Mantle and the landing area.
CAPCOM Rog, Gene.

END OF TAPE

SC Hey, Gordie, I don't know whether your camera people have anything to do this evening, but I've got a little problem for them if they'd like to work on it.

CAPCOM Okay, go ahead.

SC Well, it seems to me that we're not only moving away from the Moon, but we're moving across the face, and I took a picture about 5 minutes ago of the Moon, and it seems to me we could take another one at some X number of minutes and have pretty good stereo if we matched the printing of the two pictures in terms of scale. And, I'm wondering what's a good time elapse here for a good stereo of the whole globe?

CAPCOM Okay, we understand the problem, but I'm not -- well, we'll try.

SC Well, I guess, if you could figure out what it would -- how far we have to move across the face of the Moon and how long that would take to get about a oh, shoot, a 30 to 1 base height impression -- oddly enough, 20 to 1 would probably be better, but at 30 to 1, you could still see the stereo. And, you ought to be able to figure that problem out. How fast -- do the guys know how fast we're moving across the face of the Moon?

CAPCOM I'll put that one to FIDO. Just looking at the big chart up here, I'm sure that the rate is slowing down rapidly, and -- because you're -- the farther you get away, of course, the straighter away from it you're going. Stand by, I'll see what we can do.

CAPCOM Jack, this is Houston with kind of a crude answer to your question.

SC Go ahead.

CAPCOM Okay, it turns out right now that you're not moving across the lunar surface very fast, and you're -- it's getting less and less -- right now, I guess about a mile per minute. It would take a lot of minutes to get much of a stereo base since you're 10 000 miles out. But, remembering back to Ron's final picture there before you went to the UV attitude, after he asked the question about how high he had to be to fill up the 80 millimeter lens, I think he took one at that time. We're thinking of combining a picture now with that picture, and then enlarging the one to get it to the equivalent diameter. And, some rough calculations of your longitude at that time and -- and now, show that you've changed about 21 degrees across the surface of the Moon between that picture and the present time, which comes out, if you take the average altitude between that time and now, to about a 25 to 1 stereo base, as best I can figure.

SC Sounds good enough, Gordie. We've got it -- I got that one at 5 minutes. I mean at 240 on the hour, so that'll be probably pretty close.

CAPCOM I would guess, you know, that the angle of looking at it and other factors have changed so much that it would be pretty hard to pull them together once you -- even though you get the images reduced to the same size, but it might be interesting to try.

SC I agree.

CAPCOM Okay, Houston. There's some items coming here now in the flight plan. A couple of them mapping camera retract and cover closed, you've already done. However, right now we still see the mapping camera film rolling, so we want to leave it running until we give you a cue to turn it off and get all the film run out. And, the uplink for a state vector that's shown there will not be necessary. Over.

SC We were looking forwards to doing something. Now, we'll wait a little bit longer.

SC Couldn't you just flash a couple of lights on the DSKY just to keep us occupied?

CAPCOM Put in the crew alert or something.

SC Have to throw it in once in awhile just to keep us on our toes.

END OF TAPE

CAPCOM The surgeon had a suggestion. He said if you really get bored you could all put on your biomed harnesses.

SC Only listen to about half of what goes down will you.

CAPCOM Okay.

PAO This is Apollo control at 240 hours 42 minutes. Apollo 17 now 10 438 nautical miles from the Moon and coming up in about oh in the next 10 to 15 minutes -

SC (garble) going into PTC.

CAPCOM Stand by. As an additional Geneo go ahead as per flight plan with the one exception we'll give you a que when to stop the mapping camera as soon as the film runs out.

SC Okay, we'll hold up on the mapping camera and it's cover and we'll get the IR off.

CAPCOM Roger.

SC Okay, Gordi the IR is coming off now, mark.

CAPCOM Roger.

PAO The crew is getting ready at this time to set up the spacecraft in the passive thermal control mode. This is the mode used to maintain proper thermal equilibrium during the translunar transearth coast phases of the mission. Rotating spacecraft about it's longitudinal axis set about three revolutions per hour exposing each side equally to the Sun and cold.

SC Any updated briefing on the status of the lunar surface equipment and SIM bay findings over and above what we've got I guess. I can't remember what it was - yesterday or sometime.

CAPCOM I can't think of anything really outstanding we're just right now coming up on another charge detination; however, I think I mentioned that the LCRU is coput. So, we won't be able to watch it. We're looking at the seismometer traces here. I'll come back with any other words to update you on yesterdays report in a little bit here.

SC Okay, just update us if something news come in or something is all (garble).

CAPCOM Okay.

SC Okay, Gordie we're going to maneuver now.

CAPCOM Alrighty.

PAO This is Apollo control. We're expecting the fourth of the seismic charges one of the lunar seismic profiling experiments to detinate on the lunar surface. The nominal time for the charge to go off is 240 hours 52 minutes. And it's been our experience with the previous three charges that their tending to go within about five minutes either

PAO side of that targeted time. So, we would expect to see my seismic activity in the next oh 5 to 7 minutes. And as we mentioned previously, the television camera on the lunar Rover is not available to us. Instrumentation and communications engineer at the previous detination attempted to bring up the camera sent a number of commands and the lunar communications relay unit which transmits the television signal to Earth did not respond to the commands. We never got a picture from the camera and we're assuming that the communications relay unit and camera system on the lunar rover are out of operation. We don't at this point know what it is that has failed.

END OF TAPE

CAPCOM America, Houston. You've just run out of mapping camera film. You can go ahead and clean up the items at 2 40 30 to power down the mapping camera.

SC Roger.

PAO And it appears that our 4th seismic charge on the lunar surface has detonated. Very close to the planned time we copied the seismic activity at 2 40 53.

CAPCOM Okay, I think it should already be in with the cover down.

SC Yeah, you're right.

CAPCOM And just now the charge exploded at Taurus Littrow on the west sea and the results are on the tracers here.

SC Which one was it Gordy? Do you know?

CAPCOM Okay, it was number 8. A quarter pound charge and I guess it was 4th - I'm not sure which location that was. It was four-tenths of a mile from the LCRU, if that helps you decide.

SC Okay.

CAPCOM America, Houston. We'd like H2 tank 1 fan ON please. Don't get it up for - prior to the sleep period.

SC Okay, tank 1 is ON.

CAPCOM Thank you.

SC And Gordo, the canister is changed.

CAPCOM Roger.

SC They - Houston, are GO on

CAPCOM Go ahead.

SC Okay, Gordo. As a result of number five today and a little bit of a feeling of a little bit of gas right now with the possibility of a desire, I feel that it may be worthwhile for me to take a lomotil pill and I'd like to get your concurrence on that.

CAPCOM Okay, standby.

SC Houston, America. How are our rings looking?

CAPCOM Standby.

SC They are not down there yet. You want to wait a little bit.

SC Okeydoke.

CAPCOM America to Houston, with a response to Ron's question. Over.

SC Okay, go ahead.

CAPCOM Okay, for gas we're recommending only - we're definitely not recommending the lomotil pill we're recommending the gas pills; however, we also don't recommend the lomotils for a situation that really hasn't developed yet. If you want to discuss it in more detail we can set

up a quadralope or go ahead as you wish. Shall we?

SC Standby a minute.

SC Hey, Gordo.

CAPCOM Go ahead.

SC Yeah, we'd like to talk to you further,
please.

CAPCOM Okay. Fine.

PAO This is Apollo Control at 241 hours
18 minutes. We are going to configure the network for a
private conversation between the Flight Surgeon, Dr. John
Seiglschmid, and Ron Evans and we'll have a summary of the
content of the private discussion as soon as possible after-
wards. Evans had reported a few minutes ago that it had
been a slight bit of gas. He requested permission to take
a lomotil which is one of the pills in the medical kit which
slows down intestinal activity. The Surgeon recommended
for gas that a gas pill be taken. Lomctil will not be taken
for a problem that has not developed, but if Ron would like
to discuss the situation further we would set up a private
conversation and the conversation has been requested and
will be taking place shortly.

END OF TAPE

PAO This is Apollo Control at 241 hours 53 minutes. A private conversation is in progress at this time, with Command Module Pilot Ron Evans. The conversation was initiated at Evans' request at about 241 hours 22 minutes. Evans had previously asked permission to take a Lomotil tablet for what he described as mild gas. The flight surgeon Dr. John Zeigelschmitt had recommended that a gas pill be taken instead, and we told Evans that if he wished to discuss the situation in more detail, we would set up a private conversation. Evans requested a private conversation and that has been in progress since shortly after 241:22. Participants are Dr. John Zeigelschmitt, Dr. Willard Hawkins, Charles Lewis, the Flight Director, and spacecraft communicator, Gordon Fullerton. And we will have a summary of the conversation as soon as possible. This is Apollo Control at 241 hours 59 minutes. The private conversation with Command Module Pilot Ron Evans has concluded.

CAPCOM Now the start to roll for PTC.

SC Okay. She's GO, Gordo.

CAPCOM Okay.

PAO Hello, this is Apollo Control. That private conversation ended at about 241 hours 59 minutes, and again we will have a summary, as soon as possible. At the present time, we're in the process of getting the spacecraft set up for the passive thermal control mode rotating it about the longitudinal axis and we'll be going through the pre-sleep checklist, getting the crew set up to begin their sleep period, as close as possible to the Flight Plan time.

CAPCOM OFF, 3 AUTO.

SC Okay, Gordo, we got 1 OFF and 3 AUTO.

CAPCOM Thank you.

END OF TAPE

CAPCOM America, Houston. Over.
SC Go ahead.
CAPCOM On that PTC startup, there was only one jet that fired, and so we only got half the rate we need, so I guess the only way to recover is to stop the roll and start damping the rates in the other way and wait for our call to start it again. Over again. Over.
SC Roger, again.
CAPCOM And we'd like the procedure on GA-2 using B-2 and D-2 for the spinup. Two jets.
SC Yes. That's interesting. B-2 and D-2 are both on.
CAPCOM Okay, we understand that Ron. Let us look into that a little further here, then.
SC That's right. P-1 at DOP 1 at Bravo 2 are ON.
CAPCOM Okay, that's what did it.
SC Delta 1 and Bravo 2 is what it called for and that's what was on.
SC Yeah, that was the wrong ones though, that's the problem.
CAPCOM Well, we're reading it both in the checklist and flight plan, Bravo 2 and Delta 2 are the ones to use for spinup.
SC Yeah, you're right. Okay. We got - we're reading the wrong ones, I guess. Okay, Gordy, is this a good attitude or should we go back to the UV/PTC (garbled) attitude?
CAPCOM Stand by. G and C is on that loop here. Just a second. America, Houston. You need to go back to the pitch and yaw in the flight plan, and the present roll will be okay.
SC Okay.
CAPCOM Also for this damping we want you to go to the jets call out at 240 50 in the flight plan. That's a - you got it there.
SC Okay, we got it here. Okay, give us a call when we get all mapped out there. We got Alfa and Bravo for damping jets.
CAPCOM Roger.
SC Hey man, we got the wrong ones here. We'll get back to that. What's in the flight plan at that.
CAPCOM Roger. I would think you're firing into the SIM bay range with the present configuration.
SC You're right. Hello, Houston, America.
CAPCOM Go ahead.
SC Gordo, how's it looking for a midcourse 5?
Any further word?
CAPCOM The last information was still a half a foot. Or essentially no midcourse. I'm not sure if we've been affected by the TGC here or not, the single jet spinup but we'll let you know.

SC Okay, fine. Don't worry about it. You won't have a final word on it until tomorrow anyway.

CAPCOM That's affirmative. I doubt if we'll have any - enough tracking before bedtime to give you any update tonight.

SC Okay, no problem.

CAPCOM Now, we'd like you to configure the high gain for us. We'd like pitch minus 40 and yaw 90 on the dials and then go directly from AUTO to REACQ.

SC Okay, say again.

CAPCOM Okay, pitch is minus 40 and yaw plus 90.

SC Okay, minus 40 and a plus 90.

CAPOCM That's affirmative.

SC And REACQ.

CAPCOM That's affirm.

SC We have REACQ and NARROW. REACQ and

NARROW now.

CAPCOM America, Houston. Over.

SC Go ahead.

CAPCOM Okay, this SIM bay jett configuration, just isn't hacking the job of damping the rates. We're going to go to adjacent quads to try to get it dampened quicker. We'd like you to enable Charlie and Delta. To do that just disable all Alfa and Bravo jetts, enable all Delta jetts and also Charlie 3. Over.

SC Okay, Gordo let me disable all Alfa and Bravo first.

CAPCOM Okay, Geno, and then enable all Delta plus Charlie 3.

SC Okay, you don't want Charlie 4 enabled? Or do you?

CAPCOM That's affirmative. But it is already.

SC Okay, we're - yeah, here's what I got, I got - I got Delta 1 and Delta 2 on PD roll. I've got Charlie 3 and Charlie 4 for pitch and I've got Delta 3 and Delta 4 for yaw.

CAPCOM Okay, that sounds exactly right.

END OF TAPE

CAPCOM America, Houston.
AMERICA America here.
CAPCOM Okay, the rates look good now. I'd like
you to use Bravo 2 and Delta 2 and go ahead and spin up.
AMERICA Okay, Gordy, we'll do it - get it
this time.
CAPCOM Okay.
CAPCOM America, Houston -
AMERICA Say, Gordy, they're all off. They're all
off except Bravo 2 and Delta 2.
CAPCOM Roger.
AMERICA Yeah, we got the right amount that time,
Let's hope it stays good.
CAPCOM Okay, for Ron only, no Secondal tonight.
AMERICA Okay.
CAPCOM America, Houston, G&C, with its years of
experience, thinks that this PTC is going to hold - looking
good so far, and so I think its safe to go ahead and configure
to go to sleep there if you wish.
AMERICA Yeah, we're in the process now of going
to sleep.

END OF TAPE

PAO This is Apollo Control at 243 hours 4 minutes. The shifts here in the Mission Control Center will be changing shortly. The Frank and the Orange team, the White team. Change of shift news conference is estimated for 1 A. M. central standard time in the MSC news center briefing room. The crew is in the final portion of the presleep check list and should be turning in shortly. At this time Apollo 17 is 16 242 nautical miles from the Moon traveling at a velocity of 4062 feet per second.

SC Hello, Houston, America.

CAPCOM Hello, America, Houston, over.

SC Bob.

CAPCOM That is affirm.

SC Okay, we're just about ready to turn out the lights, by my watch about 7:20 in the morning is wakeup time and I got the other guys on their couches and I going to stand duty tonight and I'm going to leave my light weight headset in my ear, but if the high gain bothers me, during this PTC, I want to go ahead and take it out and I've got power booster connected up and it does work, so in any event, give me a crew alert in the morning, will you.

CAPCOM Okay, you want a - are you telling me you want to get woke up after 8 hours or at 7:20 as planned.

SC No, as by the flight plan. We've got to get up as by the flight plan.

CAPCOM Okay. Talk to you in the morning. And we'd like optics power off if something should show up.

SC Okay, I just don't want you to get it set up. Yes sir, we'll get optics power off and we'll get the voice off, too.

CAPCOM Okay, that suits (garble)

SC Okay, (garble)

CAPCOM See you in the morning.

SC Okay, Babe.

PAO This is Apollo Control at 243 hours 10 minutes. We have said goodnight to the crew and the down link subcarrier has been turned off on the spacecraft so we do not expect to talk to them any more this evening. As you heard Gene Cernan, the crew intends to stick to the flight plan rest period even though they got to bed a little bit late. Wakeup time at 250 hours 30 minutes or about 7:20 A. M. central standard time tomorrow. We'll keep the line up for a few more minutes in case there's any post scripts from the crew, then we'll take the line down and come back up hourly. At 243 hours 11 minutes this is Mission Control, Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/17/72 GET 245:37 CST0230 MC 920/1

PAO This is Apollo Control at 245 hours 37 minutes.
All going well with Apollo 17. The spacecraft America is 22 219
nautical miles from the Moon. Velocity 3955 feet per second.
4 hours and 52 minutes remaining in the crew rest period. At
245 hours 37 minutes this is mission Control Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/17/72 GET 246:36 CST 0330 MC 921/1

PAO This is Apollo Control. 3 hours and 52 minutes remaining in the crew's resting period. All space craft systems continuing to perform well. Apollo 17 now at 24 542 nautical miles from the Moon. Drawing closer to the Earth at a velocity of 3926 feet per second. At 246 hours 37 minutes this is mission control Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/17/72 GET 247:38 CST 0431 MC 922/1

PAO This is Apollo Control at 247 hours 38 minutes. Apollo 17 now 26 914 nautical miles from the Moon. Traveling at a velocity of 3902 feet per second. 2 hours 50 minutes remaining in the crew rest period. The spacecraft America will pass out of the lunar sphere of influence at an elapsed time of 250 hours 39 minutes 50 seconds. At that time it will be 33 822 nautical miles from the Moon and 171 593 nautical miles from the Earth. At 247 hours 39 minutes this is Mission Control Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/17/72 05:30CST 248:37GET MC#923/1

PAO This is Apollo Control. Apollo 17 now
29 143 nautical miles from the Moon - velocity 3883 feet per
second. All spacecraft systems performing well and 1 hour and
52 minutes remaining in the crew's rest period. At 248 hours
37 minutes, this is Mission Control, Houston.

END OF TAPE

PAO This is Apollo Control at 249 hours 37 minutes. 52 minutes remains in the crew's rest period as Apollo 17 is 31 446 nautical miles from the Moon, velocity 3866 feet per second. Apollo 17 will leave the Moon's sphere of influence at 250 hours 39 minutes 50 seconds at which time it will be 33 822 nautical miles from the Moon and 171 593 nautical miles from the Earth. The time at which Apollo 17 will achieve velocity match - that is the velocity both Earth referenced and Moon referenced will be the same - it is 268 hours 25 minutes no seconds. At that time the velocity will be 3839 feet per second referenced to both the Earth and the Moon. And Apollo 17 at velocity match will be 73 775 nautical miles from the Moon and 137 356 nautical miles from Earth. The Flight Dynamics officer has also computed a couple of other milestones: The one-half way in time will occur at 270 hours 30 minutes 7 seconds; distance from Earth at that time will be 132 654 nautical miles and from the Moon 78 504 nautical miles. The half way in distance mark will be reached at 281 hours 32 minutes 45 seconds. Apollo 17's distance at that time from both the Earth and the Moon will be 104 396 nautical miles. At 249 hours 39 minutes, this is Mission Control, Houston.

END OF TAPE

PAO This is Apollo Control at 250 hours 28 minutes. We're 2 minutes away from crew wakeup. Apollo 17 is 33 382 nautical miles from the Moon, velocity 3853 feet per second. We'll stand by now for the first call of the crew.

WAKEUP MUSIC HOME FOR THE HOLIDAYS

SC Good morning, Robert. Good morning.

CAPCOM Good morning, Geno.

SC Hey, your choice of music is getting better down there. We're going to have to keep you there every morning.

SC Well if I'm here waking you up on Wednesday morning, fellow you're in trouble.

SC Yeah, we're not going to count Wednesday. We'll work out something else for Wednesday. I know we're not much but we're all you've got for Christmas.

PAO The wakeup song was, HOME FOR THE HOLIDAYS sung by Jerry Vale.

CAPCOM Okay, America, this is Houston. One little update for you on today's plans. At the present time midcourse 5 is looking like a quarter of a foot per second. Which means at the present time we're not planning on burning it. So, we reserve the right to change our minds sometime in the next hour and a half if necessary. But, that'll give you some thought on what to do today.

SC Very good Bob, outstanding. We'll go along with whatever you want.

CAPCOM You guys are getting easy.

SC No, we get more likable as the days go on.

SC Good morning, Houston. This is the Command Module Pilot of the Spaceship America and we're up and ready to participate in another day's activities.

CAPCOM All right, got you there, Ron. And we're ready to participate with you also.

SC (Laughter) Okay, Robert. It was cold up here last night.

CAPCOM Well, I'll tell you, it was 27 at Ellington at 6 o'clock down here too.

SC Well, it's not quite that cold in here but there sure is a difference. And, Bob, how's America looking to you down there?

CAPCOM You're looking pretty good. We found nothing over night to give us any concern and we see nothing at the present time. Looks great. We're showing you at 56 degrees in the cabin.

SC Yes sir. We're going to get it warmed up here though starting shortly.

CAPCOM Okay, America still looks good to us.

CAPCOM And, America you're now in the Earth control. You passed about 2 minutes ago.

SC What was our velocity going through the change over in influence?

APOLLO 17 MISSION COMMENTARY 12/17/72 CST 07:21 GET 250:28 MC-925/2

CAPCOM Stand by.

CAPCOM And, Geno, you had 3851 feet per second
going through the cross-over.

SC Okay, we're looking back at a very full and
very bright, very beautiful Moon, right now. And the Man in the Moon
is smiling as he's waving us on home.

CAPCOM Copy that. We had a good picture of him last
night down here at Houston, also.

END OF TAPE

CAPCOM America, Houston. Over.
SC Go ahead.
CAPCOM Okay, we lost you there with an antenna change. That we didn't catch but we're back with you again.
SC Yeah, we noticed that.
SC Hey, Bob. What time does the old back room get up this morning?
CAPCOM Which back room?
SC The geology back room, of course.
CAPCOM Well, beats me. I don't know if there's anyone down there or not. Let me see - I'll find out.
SC No, that's all right Bob. I just want you to pass on a thought. I had a little trouble getting to sleep last night. And they've probably all ready thought of it. But, it has to do with Van Serg.
CAPCOM Go, ahead. I'll copy it down.
SC No, just ask them, if they've thought about the possibility that the - those Van Serg breccias might be might be the old indurated regolith over the subfloor.
CAPCOM Okay, I got that.
SC That's an alternative that in the heat of battle did not occur to me at the time. It should have and it may have occurred to some of them.
CAPCOM Okay. That as opposed as being a window thru - to below the subfloor, which is what you suggested the other night.
SC Yes sir. I think I - I think I'd like the regolith better it I think makes sense from a lot of points of view, the size of the crater, the fact that we should have expected to see something, but hadn't up to that time.
CAPCOM Okay. I got that.
SC And the breccias were, thinking back on it, could very easily have been soil breccias and just getting coarser as you got closer to the base of the sub - to the top of the sub-floor, which is what we were looking at down in the bottom of the crater.
CAPCOM Okay, got that.
SC Bob, is your EECOM friend going to let us practice the waste-water-dump again today?
CAPCOM I kind of expect so. Stand by and let me find out for sure. Roger, Jack. There's one coming up at 252:0, about 2 hours from now.
SC Okay, we'll start reviewing that one. We'll be ready for him this time.
CAPCOM We won't let you sneak behind the Moon on this one.
SC Very good.

END OF TAPE

SC Houston, 17.
CAPCOM America, Houston. Go ahead.
SC Who's the EECOM this morning?
CAPCOM Charlie Dumis.
SC Hey, ask Charlie if it's all right
if I turn on the commander's heaters?
CAPCOM We don't - would you clarify that
request?
SC (Laughter)
CAPCOM I'll tell you - you can - you can - use 3 -
About the only thing I can think of, Jack, would be 302. Jack, you
might use 302 if you want to. It's about the only thing we can
think of.
SC (Laughter) Yeah, you get the idea.
SC Anyway, It's cold.
CAPCOM Roger.
SC It's not really that bad, Bob, but we're hearing
a lot about it.
CAPCOM Okay, well, we'll work it out here
if we can try.
SC Well, you might discuss it with SPAN.
CAPCOM We are, believe me.
SC I'd like not - not to waste 302. It's
got some other good uses.

END OF TAPE

CAPCOM America, 17. Let's say it again.
America, this is Houston.

SC Are you sure? Would you like to try again?

CAPCOM Well, that's all right Jack. We'll live with it for awhile. We're looking at an unedict - Now we're looking at your temperature problem and there's a couple of obvious things I'm sure you've undertaken but if you haven't - all the window shades off. Get some sun light in there and might crank on all the lights to get some more heat load in there. Also the - first, the cabin fan and the temperature - cabin temp control thumb wheel is your option on that. The other things like mixing valve adjustment and powering up other items we're looking at very seriously but we would like to not do those items until after the EVA this morning. We'd like to remain the status quo on the ECS system with the exception of you do have the cabin fans on your option there. But we would like to retain the rest of it status quo until after the EVA.

SC Well, thank you for all your researching there, Bob. I'll let the commander make the decision. It - it's his thermostat.

CAPCOM Rog.

SC The CMP feels pretty good so - I'll see if they can give me a bath this morning. That will warm things up. Temperature's on the way up.

CAPCOM Roger.

CAPCOM Trying to get reel (garble) going.

SC Pardon.

CAPCOM Said, I'll bring reel 2 up to you if I can get there.

SC Well, reel 2 is - would sure be a (barble) to start when you consider all I've got is Ron and Jack.

END OF TAPE

SC Hello, Houston, America.
CAPCOM Yes, sir.
SC Okay, Bob, before we exit PTC at 20 passed
the next hour we'll have to get your final word on the midcourse.
CAPCOM Well, we're working up the midcourse
right now, but let's give you some preliminary words that
you won't exit PTC at that time because midcourse 5 is not
required - it's less than 3/10 of a foot per second.
Right now your gamma - flight path angle et cetera at entry
interface is all nominal, and absolutely no midcourse 5
required at this time. And we'll be updating that as we
fine the data.
SC Okay, well we still exit PTC, Bob - we
go to a different attitude - yes, we'll have a different ROLL
angle. I'm looking at the right hand column of the flight plan.
Yes, we still exit so we're going to need some words on it by then.
CAPCOM Stand by on that. I just got back at
252:20 and was just giving the word that we will not -
SC It's just the case of using a couple
of jets Bob.
SC Bob, you want the IR on?
CAPCOM Roger, we're ready for it.
SC Mark it, it's on.
CAPCOM America, Houston. We'll assume right
now - go ahead and fly the flight plan using the notes on
the right hand column there as planned.
SC You say we will use the notes on the
right hand side, right?
CAPCOM That's affirmative. And we have one up-
date. We would like to move up to 252:10, we'd like to move
up the IR cover -
SC Go ahead.
CAPCOM We'd like to move up the IR cover open,
which is at 252:22, move that up to 252:10 - just put
an arrow up there, please.
SC Okay, we got it.
SC Hello, Houston, America.
CAPCOM Yes sir, go ahead.
SC A quick update on the crew status report.
The well being of the crew is very satisfactory. Capable
of carrying out everything that is required today and spe-
cifically the health of the crew is excellent.
CAPCOM That's real good news.
SC Okay.
CAPCOM Just for your information, Ron gets the
same treatment today that you 2 surface walkers got. During
the mission, Channel 8 in Houston is going to carry the full
spacewalk in its entirety on live television.

APOLLO 17 MISSION COMMENTARY 12/17/72 CST 8:48 GET 251:55 929/2

SC Hey Bob, I think that's outstanding.
Thank you.
CAPCOM America, Houston. I've got a flight
plan update for you.
SC Go ahead, Bob.
CAPCOM Okay, first of all - at 252:20, where
it says exit G&N PTC at ROLL angle 071, change the high gain
angles there to minus - a PITCH of minus 64, YAW 329.
SC Okay, we got those.
CAPCOM Okay, at 252:30, close UV -

END OF TAPE

CAPCOM UV cover. And that's to be done regardless of the fact we're scrubbing mid course 5. Just close UV cover at 252:30.

SC Okay.

CAPCOM And if you'll jump over to 262:10, - 262:10 we've got a change on that attitude. And we're just tweaking it up a little bit - 039 230 297; high-gain angle pitch minus 9; yaw 339.

SC That 039 230 297 mine 9 and 339.

CAPCOM That's affirm. We're just shooting a slightly different point with the UV at that time.

SC Okay.

SC We're ready - no, stand by.

CAPCOM And we've copied the 93's. You can go ahead and torque.

SC Okay, we'll torque at 11.

SC Okay, the R cover is open.

CAPCOM Roger. Good show.

CAPCOM America, Houston.

SC All right. Houston, America. Did you call?

CAPCOM Rog. I called that we're about ready to lose the high-gain. I'll call you back as soon as we get back in.

SC Houston, America.

CAPCOM Go ahead, Houston. Say, you can't. Go ahead, America.

SC Okay, we've got the commanders menu for yesterday.

CAPCOM Roger, we're all listening.

SC Okay, scrambled eggs, bacon squares, pineapple drink, orange drink, plain old coffee, and 10 pecans - there's 10 nuts in those packages, and a vitamin. For lunch, bread, a chocolate bar, an orange drink, and a can of tuna fish. For dinner a beef-a steak-a, butterscotch pudding, peaches, orange drink, and catsup. Medical 17055 about 5 hours of fair - no medication - 4 1/2 cans of water. For the old lunar module pilot - scrambled eggs, an orange-pa drink, coffee, sugar cookie, and 2 pecans - that's 2 nuts - not two packages, and a vitamin. For lunch peanut butter, jelly, bread, orange-gf drink, pork and potatoes, coffee, and a fruit cake. For dinner beef-a steak-a, butterscotch pudding, 1 peach, orange drink, and a coffee. The LMP medical log - he had about 6 hours of good sleep - no medication - and 2 cans of water.

CAPCOM Wait Ron, we're going to have an antenna switch coming up. We'll call you back when we get good COMM.

SC Okay.

END OF TAPE

CAPCOM Okay, America. We're back with you.
SC Okay. Just one second.
CAPCOM Just a reminder on the food report if you
want to shorten them. It's normally used negative reporting -
only those things you don't eat on the menu.
SC Oh, well. I like to talk.
CAPCOM Roger.
SC Okay, for the Command Module Pilot. For
breakfast; he ate everything. Okay, for lunch; let's see, he
ate everything down to the bread, then he had 3 slices of bread,
didn't eat the cherry bar, add a tea a chocolate bar and a pack -
Wait a minute I've got the wrong day, sorry. Make it everything
I've said on the CMP. Okay, we're on the CMP again. This time
it's day 11. Okay, make it 6 bacon squares instead of 8, 10
didn't eat the peaches, add a coffee, package of brownies, and
10 pecans. And the vitamins, ate the vitamins. Okay, for lunch,
scratch the cherry bar and add a coffee. For supper, add a
ketchup. Okay, CMP's medical log. 150:54, about 6 hours are good,
2 lomenthol, 2 sniffs of nosedrops, 4 cans of water.
SC Okay, Bob. We've stopped PTC and we're going
to send major COMM.
CAPCOM Roger.
CAPCOM Okay, America. We'd like to cov - close the
UV cover, please.
SC Okay, the cover's now closed.
CAPCOM If you're all on the headset, if you'd like
we've got the news for the morning.
SC Okay, we're all on.
CAPCOM Okay, we start today's newscast out with
this Historical Fact, today marks the 69th Anniversary of Man's
first flight in a Heavier than air powered machine. Back on
December 17, 1903, Wilbur and Orville Wright, of Dayton, Ohio,
took 3 Historic flights on the sand beaches at Kitty Hawk, North
Carolina. The brothers will be honored today at a ceremony at
avisitor's center near the flying site. Now, a look at the
news. There's apparently been a serious hitch in the Peace Talks
between the U.S. and North Vietnam. Dr. Henry Kissinger, in
a curt news conference at the White House, has said, that
the North Vietnamese have reneged on an earlier agreement and have
brought out - brought the Peace Talks to a halt. Dr. Kissinger
said, the unresolved problems which center around the number of
Peace Supervisors and their placement is not acceptable to the
President, and Kissinger feels, and we quote, "We have not yet reached
an agreement that the President considers just and fair." Final
unofficial returns from the federally supervised election, name
Arnold Miller the new President of the United Mine Workers. His
victory over Tony Boyle appears to be only his first step in his
promise to clean up the union. Former President Truman remains

CAPCOM in serious condition at a Kansas City, Hospital. Doctors say that the 88-year old Truman is not responding to treatment. In the congressional spotlight in Washington it appears that the contest for the position of House Majority Leader will be between Representative Thomas O'Neal of Massachusetts and Congressman Sam Gibbons of Florida, who will vie for the post left vacant by the absent and presumed death of Congressman Hale Boggs. Boggs disappeared in the crash of a light plane in Alaska, in October.

Northeastern Ohio has been blasted by a blizzard. As much as 28 inches of snow has fallen, blocking highways and closing airports. An additional foot is expected - was expected before it was to move east. Cleveland has been very hard hit with the white stuff. And, the snow is now moving into the northeast. They'll all have a white Christmas up that way. Here in Clear Lake, it's a clear-crispy day. But, a chilly Sunday Morning. Ellington had a 27 this morning.

Might take a look at sports here. Miami defeated Baltimore yesterday 16 to 0, to go undefeated in the American Football Conference of the NFL.

CAPCOM America, Houston. The UV cover appears on our telemetry to still be open. Would you cycle it and see if we can get it closed, or just give us what your onboard talkback looks like.

SC Okay, Bob. I got it - I only got it to the intermediate position.

CAPCOM Roger, thank you.

CAPCOM Okay. In a real hair-raiser at Candlestick Park, San Francisco, John Brody came off the bench late in the game, in fact, in the last 2 minutes of the 3rd quarter and led the 49'ers to a 20 to 17 win over the Minnesota Vikings. The win gives Western Division Crown to the 49'ers in the National Conference. His - the last touchdown thrown was with 5 seconds remaining in the game. That puts the Washington Redskins, Green Bay, San Francisco, and Dallas Cowboys in the NFC playoffs and closes out the NFC contest. In the American Conference, there's one key today to decide the winner of the Central Division. Pittsburgh plays San Diego, and Cleveland plays the New York Jets. Both Cleveland and Pittsburgh will get into the playoffs, but their position in the standing is now yet known. One will be the wild-card team, one will be the Conference - the Division winner. Miami and Oakland are the other teams in the American Conference playoffs. Cincinnati plays here at Houston. And we'll keep you posted on that one. Local high school football, Baytown-Sterlings scored a major upset by defeating San Antonio Lee in the 4A semifinals. The score was 21 to 20 and the game in the Astrodome before 26 000 fans. The loss was the first in 28 games for the

CAPCOM San Antonio school. In basketball the Houston Cougars downed California last night 79 to 75. Some other major college scores, Kansas 60 over San Francisco 58, Penn State 65 over Boston 63, New Mexico State 69, Texas El Paso 49, Indiana 89, Ohio 68, Minnesota 87, Loyola 81, Florida State 85, Baylor 67, and in pro basketball - Houston defeated the Detroit Pistons 123 to 112. And just a final note from all your friends down at Cape Kennedy, they'd just like you to know that the Merritt Island High School won the Florida State Championship, defeating Tallahassee Leon High School 40 to 21. And, that's pretty much the update for the morning.

END OF TAPE

SC Thank you Robert for that Sunday morning
news break.

SC Houston, America. Are we GO for the
fuel cell and waste water dump and the other dumps to go?

CAPCOM Roger, you're GO for that and we're
watching them down here.

SC Okay, we'll start the waste water
dump.

CAPCOM 17, Houston. We'd like AUTO on the
high-gain.

CAPCOM America, Houston. I don't think I
ever updated your consumables and just a real quick update.
You're above the line on all your oxygen tanks. You're
above the flight plan line on all your hydrogen tanks or
right on the line. And you're 3 percent above the line
on the RCS - that's flight plan usage at this time - so you're
above the line on everything.

SC Okay, Houston. Thanks much.

CAPCOM America, Houston. You're the MC and W on the
fuel cell and O2 flow high is normal.

SC Yeah, I guess I finally learned that,
Bob, and it didn't bother me a bit.

CAPCOM America, Houston. While you're working
on the fuel cell area there, we'd like to reconfigure our
H2 tank fans. We'd like H2 tank 2 fans to ON, H2 tank 3
fans to OFF.

SC . Okay, you got it.

END OF TAPE

SC For awhile, until things stabilize.

CAPCOM America, Houston.

SC Go ahead.

CAPCOM We haven't heard any reports from you on - and we're just kind of curious. Have you had a lot of condensation moisture around the cockpit?

SC Negative. It's been very dry.

CAPCOM Okay, real good. Well, just a reminder may not be applicable if you've got a good dry cockpit there. On 16 we had some rather strange readings on the evap out temperature and a few other ones. And the potential is there for you to get those same readings, especially if you have had moisture. The potentials is to get those readings after depress and we'll be watching it closely. I don't want to see you just ignoring them but we'll be watching them and take any readings for after depress there with a grain of salt. And while you're at it you might go down and zero the optics if you've got somebody in the LEB.

SC Okay, Bob. Stand by. We'll get that. Listen, the tunnel is dry up to the hatch. However when you put your hand up in the tunnel around the - the edge of the hatch and on the - on the outer periphery of the hatch itself there is quite a bit of moisture up there. We looked up there yesterday and couldn't find any but there is some up there today. And the face of the hatch is slightly moist but it's not-nothing like Lovell's.

CAPCOM Okay. We'll we just want you to be aware that you may see some extraneous ECS readings. It's no problem at all but, you know, just wanted you to be aware of it.

CAPCOM Gene, the specific thing on 16 that occurred as we thought it out was - that the ECU control unit back of that panel there had the freezing - we think - freezing of the water on it, causing the bad readings.

SC Okay. When we change the canister this morning, Ron tells me there was water back there, too.

CAPCOM Okay. Well just - we can just expect some possible erroneous readings.

SC Optic to ZERO. G and N power is OFF.

SC Houston, America.

CAPCOM Go, America.

SC Okay, Bob, we're eliminating everything in the flight plan between 253:10 where you terminate the waste water dump, which has been done, and we're picking it up on EVA checklist at 253:50.

CAPCOM Okay, that sounds great, Gene-o. Press.
SC Okay.
CAPCOM And 17, if we could have ACCEPT we'll
give you a state vector.
SC Okay, Mr. R, You've got ACCEPT.
CAPCOM Okay.
CAPCOM Say again. Oh, the computer 's yours,
America.
SC Okay, thank you. The computer is ours.
CAPCOM Rog.
PAO This is Apollo Control at 253 hours
16 minutes ground elapsed time. Apollo 16 coasting home
now 167 091 nautical miles out from Earth. Velocity
3034 feet per second. Midcourse correction burn number 5,
which is nominally scheduled at 253 hours 42 minutes ground
elapsed time will not be performed in as much as the
correction is less than a half foot per second required.
Meanwhile, the spaceflight meteorology group with the
National Weather Service said this morning that weather
conditions are expected to be satisfactory for the landing
and recovery of Apollo 17 on Tuesday. The weather forecast
for the planned landing area, approximately 360 nautical
miles southeast of Pago Pago, calls for partly cloudy
skies, widely scattered rain showers, variable winds at
10 miles per hour, seas at 3 feet, and the temperature
near 80 degrees. Still approximately 4 hours away from
the transearth EVA in which command module pilot, Ron
Evans will go hand over hand back to the SIM bay and
retrieve film cassettes from the cameras and instruments
in the SIM bay, pass them back into the command module
for return home. At 253:18 still up live as long as the
crew is awake, this is Apollo Control.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/17/72 GET 253:18 CST 1011 MC-934/1

SC Houston, 17.
CAPCOM Go ahead, America.
SC Yeah, take a look at the LMP's biomed and see
how it looks to you this morning.
CAPCOM LMP's biomed looks pretty good, American.
SC Okay.
SC Okay, Houston, the command module pilot bio-
med should be on the line.
CAPCOM Okay, Ron, we'll give you a word here.
CAPCOM Ron, your biomed looks great.
SC Okay, mighty fine.

END OF TAPE

SC Hello, Houston, we just turned the cabin fan off.

CAPCOM Roger. We are copying it, cabin temp around 70, is it a little more comfortable?

SC Well, we got two extremes.

CAPCOM Okay.

SC Okay, let's see now, the AM umbilical bag is on the Rock Boxes, on the LiOH cans now. What's next, Jack? Yeah.

CAPCOM America, we're showing -

SC (Garble) Go ahead.

CAPCOM We're showing a slightly high O2 flow, we're just wondering if all the waste compartment vents and all your dump vents are flowed as per the flight plan.

SC Well, as a matter of fact, no. Overboard drain was opened - let's see, battery vents closed during the water dump and now it's to vent. Waste stowage vents now closed. We're thinking about opening our waste stowage vent anyhow to keep any possible breakage in there from coming back into the cabin, and that way it might go outside during the depress instead of inside. What do you all think of that?

CAPCOM Let us debate that one, it sounds pretty good but let us debate it.

SC Okay. Tom, the principle concern is those BUSS amples.

CAPCOM Rog. I understand your concern. I - we'll work on it here, I don't think there's any problem to it.

SC Okay, but all I'm saying is that the BUSS samples have never flown before. Yes, the EVA umbilical back (garble) Okay, they're up, up there, but let me make sure it's sitting down on the bottom this time. I didn't think of anything yet. Just hold it on that side. Okay, the 82 rock bag is tied up. Yep. Okay, that 87 bag's all squared away. Okay, and let's see what we got this in (garble) at the bottom. Now a temporary storage bag is clear in the trunk. And we want to leave them there and open the bottom. Are they tied up? Okay, here we go. Okay. Yeah, I'll have to (garble). Yep, LBVA are okay. Okay, we got everything we want in the jett bag now?

END OF TAPE

SC Hey, Houston, this is America. Obviously I'm on VOX here so I'll keep you informed on how things are going.

CAPCOM America, Houston.

SC Okay, go ahead.

CAPCOM Some words concerning the waste management vent, we really don't care what you do with it now until 20 minutes prior to your suit integrity check. We would like to have it closed for a good stabilized reading during suit integrity check and it requires to be closed 20 minutes prior to that time for stabilized flow. After the suit integrity check if you desire to open it during the cabin depress - that's okay with us.

SC Okay, we'll leave it closed now, and during cabin depress, we'll probably open it.

CAPCOM Okay, would you like us to remind you on it or just press on like you are doing?

SC Yes, that's affirm. We can use all the help we can get.

CAPCOM Roger.

SC Okay. Okay, Jack you (garble)

SC Okay, temporary stowage. On the - no got on the mag already. One the camera, yeah.

SC Okay, 8, okay. Yes, that's a biggy. Okay, let me verify. I think I've already got that. Ahah, there it is. Yep. Ahah, there it is. Okay, we've got that one. Check it. Yes, we're okay. Yes. I don't have mine on yet, but here it is. Yes, it's there. It's installed. I screwed the (garble) open. I got it open, but I didn't take anything out. Everything was already out. Okay, TV Pole (garble).

SC Okay. Gene, do you know how to run a (garble)

SC Okay, what did you say, over to 82 now?

SC Okay, we're 82.

SC Okay, Houston, America. The OPS checks out at 5900 psi and is regulating to 3.9.

CAPCOM Roger, Gene.

SC Okay, the old EVA bag is installed.

SC Okay, and the EV gloves are on. Okay. Okay. For some reason, they're called (garble) boots up here.

END OF TAPE

SC Okay. Tie down cables ready to go?
SC Okay. And the ah -
SC Okay, everything goes (garble), huh?
SC Okay, that bag is in there, EGRESS pads,
tie down ropes and few clips.
SC Okay, (garble) SEP bag is in the EVA bag.
SC What'd we do with that tissue dispenser,
Gene? We use it up?
SC Yeah, that one right there. Ah, ha. There's
the old pressure gauge. And it reads 0.
SC Okay do the rest of them touch. Ah, this
one redo.
SC Okay. Ah, ha, this one - Now.
SC (Laughter) I was just acting smart, I don't
really know where they go.
SC That's a little (garble) that way.
SC They're not on yet.
SC (garble)
SC Got it (garble).
SC Ah, yeah.
SC Hatch doors are stuck.
SC Okay, counter balance is all squared away.
SC Yes.
SC Okay.
SC (garble) What kind of lens?
SC Okay. (garble)
SC Let's use that other (garble) It goes on
the pole with the (garble)
SC Well, we'll do (garble) on the pole first
I guess.
SC Al (garble) bag.
SC Oh, okay, I know what you mean. I've got
to get Al so that's okay.
SC (garble) my jett bag is down there.
SC Okay, the old jett bag's on the inside now.
SC In my (garble) pocket.
SC Okay, (garble)
SC Okay.
SC It's out of here again.
SC No, it's -

END OF TAPE

SC Houston, in case you're wondering, we're still routing cables.

CAPCOM Roger, we've got you down in the check list, the step where just prior to S-band AUX TV to SCI. Do you concur on that?

SC Yes, we're still keeping TV and DAC cables (garble) up the pole.

CAPCOM Roger, we get you Ron.

SC (garble) Okay.

CAPCOM America, Houston.

SC Yes, go ahead.

CAPCOM Is Gene in the Commander's seat at this time?

SC That's affirm.

CAPCOM Okay, I'll delay then - a minute here, we're going to have a verb 49 maneuver coming up to you. We're getting the SIM bay a little bit cold, and we want to warm up those hand rails so we'll be maneuvering here at about 4 - at 254:45 I'll have a maneuver for you.

SC Okay, we're ready from now on any time.

CAPCOM Just stand by. We want to check out the numbers. I just wanted to give you the word that we were going to make this maneuver.

SC Any time, Bob, well, you're going to have to put on your helmet - it's really over that way a little bit. You got to get into the hatch to get it out.

SC Okay. Well, that's all taped up.

SC There's the old (garble) IV tether.

SC Ahah (garble)

CAPCOM America, Houston. I've got the V49 maneuver.

SC Okay, go ahead with the numbers.

CAPCOM Okay, it's ROLL 150, PITCH 216, YAW 330, and we'd like that maneuver to start at 254:45. Just prior to starting that maneuver, we'd like the IR cover CLOSED and IR OFF.

SC Okay, at 24-45 you want 150 216 and 330, prior to maneuver, you want IR CLOSED and OFF and what about the jets on that Bob?

CAPCOM The same jets you have configured. Did you read ROLL 150, PITCH 216 and YAW 330. Is that what you read.

SC That's what I read and I'll stay in SIM bay jets.

CAPCOM Okay, you'll need these new high gain antenna angles. PITCH minus 32, YAW 52.

SC Okay, PITCH is minus 32 and YAW 52. Got it.

SC Okay, then what. Okay. Okay. I'll get off the headset now then.

SC Okay, panel power OFF, suit power OFF and AUTO control normal. Got it?

APOLLO 17 MISSION COMMENTARY 12/17/72 CST 11:21 GET 254:28 939/2

SC Control normal. Okay, panel 604, Geno is suit pressure alarm OFF, verify. Ball caps are 603, map CMP comm carrier cable from fuel to umbilical and we'll beep for you on it when you're -

CAPCOM America, Houston.

SC Ready. Okay, we're going to go ahead and close the IR and turn it off at this time.

CAPCOM America, Houston. Would you just close the IR and we'll cue you on the OFF call, we'd like to see that here and we'd like to do that as a cue.

SC Okay, it's OFF. Okay, we closed her - covers closed. Mark it. And it went gray.

CAPCOM Roger, we copy that.

SC Okay, route outboard of the strut and wires and connect CCU head to 603.

END OF TAPE

CAPCOM Geno, I'd like to give you just one bit of information, we just got from the simulator. When you go from this new attitude I just gave you, this VERB 49 attitude right now to the EVA attitude, you will see a middle gimbal angle of 66 degrees. That's right off the simulator.

SC Okay, Bob. Thank you very much.

SC Gravimeter in, Bob.

SC Okay, you got it connected? Be sure and cable the TV bracket top of strut using 2 straps.

SC I know.

SC Okay. Understand that. Serve cable and that's the same one the comm cable's to, TV bracket top of strut using 2 straps. You got that?

SC Okay. Let's see the - TV monitor. You got that? And ah - Connect PGA bag couch at 4 places, Ron. It's the old remove center couch bit.

SC Going to have to move the old jett bag, though. Back over to your side, I guess.

SC Yeah, let's get this jett bag over on the other side.

SC You want to unhook the PGA bags.

SC I've got the top 2.

SC Okay. Now, you can take the center couch down.

SC Yep.

SC (garble)

SC It certainly comes out easier doesn't it. You realize you're going to have to - aim it that way - That's right.

SC Gosh - this place is fuller than the mock ever was.

SC That's the old full spacecraft story.

SC Well, look what turned up here.

SC The clock.

SC Maps. Well they should be in R5.

SC Wait a minute.

SC Yeah.

SC Okay. (garble). Yep. Okay, close and lock your old marman clamps.

SC Closed and locked. Okay, open the old, the EVA umbilical bag.

SC Opened.

SC Unsnap the top strap and remove spacecraft down to EVA UMB all the way to the second tie-down strap.

SC And you're going to attach that to 603, but verify that the EVA Station 02 is off.

SC Attach the EVA umbilical to 603, move over at couch beam and under wires.

CAPCOM Jack, whenever it's convenient you might turn off the IR now, it's looking great.

SC Okay. The IR alarm switch is going to OFF.
MARK.
CAPCOM Thank you sir.
SC Okay, you got the O2 locked.
SC Yep
SC (garble). Lock umbilical (garble) to couch ring
lock and install pin. Got that. SCU open, bleed system, SCU closed.
SC Okay, and you can close them if your system
has let down. Unstow press gage to EVA bag and connect the gage
to 603. And tape the the flash light to panel 603 guard g.
SC Okay. And install the gage?
SC Yeah, and then install the gage, tape the
flash light, and then we can get rid of the tape. Got one? Leave
the tape on that so the light won't get out, Ron. (Laughter) Jerry
Griffin told me that one.

END OF TAPE

SC I want your tape. Did you stow the tape?

SC I stowed it right there in the temporary storage bag, top pocket. First valve stowed in EVA bag. First valve patch - pouch. And then the weight tethers, also. Oh doo doo doo doo - Weight tethers are in that bag.

SC Houston, do you have recommendation on whether we use 208 or 211 purge valve? You were very interested in that on the lunar surface. Here's yours -

CAPCOM Stand by. We're getting it.

SC Bob we're using my OPS, so I'm assuming it will be 208.

CAPCOM That sounds good, Gene.

SC Okay. Here's one tape. Throw it in the EVA bag in the proper pouch and then get the weight - both weight tethers out. And we can attach them up here to the guards. Yep, I'll get them. And we want one over on the other side. Where was the other one? Okay. Purge valve weight - and there's another weight tether in the EVA bag. Now, looks good. I'll put that up. Oh, that's yours, I'm sorry. (laughter) I was looking for this one. All right. Yeah, that's the one. Not very far down. Numbers. Okay.

SC Okay Bob - We're at the attitude and high-gain is set and I never did see that middle gimbal angle get to 60. Let's go to CDR's LEVA and leave the EVA bags and LEVA bags. EVA glove.

CAPCOM Okay, Gene'o, it will be the next maneuver that you'll see that middle gimbal line going out around 60 - 66 degrees.

SC Okay.

SC But you're a magic little thing, there. (laughter) And particularly since your going to be looking into the Sun. (laughter) Hey, where? Kind of damp. Put the - put them in the pad TSB. No, not yet. That's VF - Yeah, that's part of the LOP LEVA and EV gloves. Put the gloves in the top pocket. Oh, they're in the left hand top pocket. You can wipe those off quite a bit with - They're not half bad now. I don't have any instructions. (garble).

END OF TAPE

SC Okay. I think we can just stick these up in the couch.

SC Yep, ah -

SC Why don't you leave on the helmet? Okay LEVA bags are up in the tunnel. Then when you get to CDR's (garble) out 2.

SC Houston, this is America. By my count we're still about 30 or 40 minutes ahead here.

CAPCOM Roger, Gene. You're looking good.

SC Oh, I'm not to far. Can't tell from this, it's the next page. Huh? Yeah. (Garble) I wouldn't know if my helmet was fogged up or not.

SC Suppose to have put them in the left hand ah - Got a place for that (garble)? Somewhere I ceased to be careful with my helmet. I've (garble). (Humming)

SC Okay, have you got the CDR's helmet unstowed? Do I need gloves?

SC Put your helmet stowage bag over there yeah. (gable) accessory bag in the stowage bag. IV gloves in the temporary stowage bag. Okay, you got your helmet on. Verify that you're visors, verify the LEVA visors. Okay, and we antifogged. Okay. And the helmets and LEVA's are under the CDR couch. Stow loose items, verify all your loose items, Gents.

SC Going to use it all.

SC Okay, let's verify that from now the cover's closed. Covers are closed. Panel 230, mapping camera, OFF. Sounder recorder is OFF, IR is OFF, self test. Just about. You can work in that direction now. You're happy with loose items and everything?

SC (garble)

SC Ah - CMP, first.(garble). Yeah, They've gotten it. Yeah, then me, and then you.

SC I'm just reading you the procedures, that's all.

SC Okay, Houston. For a little while things may sound a little bit confused. W're going to do the old thing about getting into suits.

CAPCOM Roger. We're copying that.

SC And if you don't hear from us - If you don't hear from us, off and on, well that's ah - because we're not talking to you.

SC And, Bob. The CDR's going off the loop right now. I'll be back in plenty of time for that maneuver.

CAPCOM Okay.

SC And ah- let's see, continuing right here. Self test is OFF and the UV is off, and data says to On switch is to off, strange as that may sound. And - I can, yeah I will - I'll stay on for a while. Until Gene gets through (garble)

APOLLO 17 MISSION COMMENTARY 12/17/72 CST 11:59 GET 255:06 MC-942/2

SC And the panel 5 instrumentation science (garble)
D circuit breakers are coming open. 2 are open. Bob, you may
wonder, what's that.

SC I already stowed mine in my temporary stowage
bag.

SC That's it.

END OF TAPE

CAPCOM America, Houston.
SC Yes, go ahead.
CAPCOM Did Ron unplug from the biomed for a while?
SC Yes, he is off the biomed for a while.
CAPCOM Okay, thank you.
SC But you can look at me for a while.
CAPCOM Yes, you're there.
PAO This is Apollo Control, while the crew is suiting up, some spacecraft distance and velocity numbers. The current distance from the earth 163 130 nautical miles velocity 3131 feet per second. It's 255:30 and the crew is way ahead of the timeline in getting suited up and preparing for Ron Evans EVA. However, it is unlikely that they will begin EVA early. That remains to be seen of course. And at 255:30 this is Apollo Control.
SC Okay, Houston. Gene's got his suit on now, and he'll help Jack get into his.
CAPCOM Roger, Ron.
SC In case you're wondering, we changed the procedure there a little bit. It was more convenient to get those guys suited first and then me.
CAPCOM Okay, we'll buy that. You are still off of biomed. Do you concur on that?
SC Yes, if you want to take a look at it, I can plug it in here. I'm on Jack's headsets now, but I can plug it in if you want me to.
CAPCOM No problem - no problem - just wanted to - you know, it's easier to remind you now than it is to have you unzip the suit or something.
SC Oh, okay. Yes, I understand. Let me check and see if it's still working. I'll go off first and then back on.
SC Okay, it's hooked up now.
CAPCOM Roger, Ron. You look good. You're breathing.
SC I'm breathing, huh. Okay.

END OF TAPE

SC Okay, Bob, CDR's suited and back on the comm
and biomed.
CAPCOM Okay, we copy that.
SC Houston, how do you read the LMP?
CAPCOM LMP, we read you loud and clear.
SC Okay, on that suit pan all is nice and calm
now.
CAPCOM And be advised the CDR and LMP both look
good on biomed.
SC Okay. And we're going to get the old CMP
in the suit here.
CAPCOM Okay.
SC That or we'll let him do it by himself since
he's so proficient at it now.
CAPCOM America, Houston. We're tracking you as being
somewhat ahead on your timeline, so don't rush on the - on the
suit donning.
SC Roger. We're not rushing, just going at it
systematically. We apparently learned how to do it, though,
somewhere along the line.
CAPCOM Okay, well, just want you to be advised we
don't particularly want to start early and, therefore, you're
ahead of the timeline right now. You can take a break after-
wards maybe.
SC Okay, Bob, we're aware of that one.
SC I understand, Bob, I understand.

END OF TAPE

SC Houston, this is the LMP. I've got something for you, you've been looking forward to. It's a number, it's 24173.

CAPCOM Roger, Jack

CAPCOM Jack, I wasn't sure what you were talking about there for a minute, but it lit up the face on the panel next to me. Everybody's happy now.

SC Good. I'm sorry about that, Bob. Tell them that it was not intentional to leave it in the suit. As a matter of fact, it might be worth a reminder when you think we're unsuited to take it out.

CAPCOM Well, if you wouldn't mind a reminder, we wouldn't mind giving it to you.

SC Alright with me.

CAPCOM We're writing it in to the EVA check list, right now.

SC Houston, we're on top of 3-8.

CAPCOM Roger, understand.

SC With the exception of the verb 49 maneuver, the other pages are complete.

CAPCOM Roger, you read my mind on that one.

SC Say again?

CAPCOM You read my mind. That was the next thing I was going to ask you, I hadn't seen a verb 49 and that's on that page that isn't required at this time.

SC Yeah, right. We're standing by for your flight plan time, we'll maneuver in the flight plan verb 49.

CAPCOM Roger, we understand.

SC Okay, verify your SEU CLOSED. You ready to go?

SC Panel 2, cyro press indicator is B, panel 603, EVA station 02 on. Verify EVA station 02 gauge reads approximately same as surge tank. Surge tank reads 850. I guess that's approximately. (laughter)

SC (garble)

SC Okay, SEU OPEN. Verify flow and purge umbilicals. And then the panel 603 EVA station 02 OFF.

SC 02 OFF.

SC Okay, you verified all that. (Laughter)
Weights - remove weights, belts storage straps from umbilical and stow in EVA bag.

SC Okay, that's done.

SC Connect EVA umbilical electric panel to CMP PGA, right hand blue and lock. You're going to connect the EVA umbilical to yourself.

SC Okay, your electrical and 02 are connected. Right hand blue and locked.

SC Okay.

APOLLO 17 MISSION COMMENTARY 12/17/72 CST 12:47 GET 255:53 945/2

SC I transfer the LEB, I didn't see that
in here.

SC There it is.

SC Okay, your next big step here is to
connect the waist belt and lock - buckle on the left hand
side.

SC Hey down there now, Ron, can I help you
with the connections? You don't have to be going down there,
you know until -

END OF TAPE

SC No.
SC Okay. Yep, that's good. You'd like it pointed
down, right?
SC Yeah, that makes sense.
SC Now, is your belt under the scissor pocket?
SC Okay. We got our comm carriers on, so that's
no problem. Gotta put your comm carrier on now.
SC And then we do the comm check.
SC Hey, Houston, this is the old command module
pilot back on the loop and how do you read?
CAPCOM Read you loud and clear, Ron, and biomed's
clear.
SC Hey, okay.
SC Hey, some power at panel 10, Ron. Power audios,
suit power's on, mode VOX.
SC Okay, we're in VOX. VOX in (garble) as
required, approximately 7.
SC Well, if it works good at 9, I'll try it
down here. I don't know where - Well, leave it all the way up.
Leave it on 9. It works that way.
SC PAD comm off. PAD comm is off and S-band
TR.
SC S-band TR.
SC Audio control normal.
SC Audio control's are normal.
SC Intercom TR.
SC Intercom TR.
SC And VHF AM off.
SC VHF is off.
SC Okay.
SC Okay, Houston, the AUX TV is going to TV now.
CAPCOM Roger, Jack, we see it.
SC Not much of a picture, I was looking right
at the floor.
CAPCOM We don't see the picture, but we saw the S-band.
SC Now look at the camera.
SC Oh, okay.
SC Yeah, yeah. (Laughter) Okay. Okay, I read
you loud and clear.
SC Okay, yep.
SC Hey, we're going to have to move this TV a
little bit because I can't get the hatcg open.
SC Houston, I think you heard from the CMP and
the LMP. Why don't you try the CDR and see if he hears you.
CAPCOM Roger. I thought I already had a contact
with Gene. CDR, how do you read Houston?
SC Still reading you loud and clear, Houston.
CAPCOM Roger, CDR.

SC Houston, America. That VERB 49 maneuver
You want me to be there at 56:30, you want me to maneuver at 56:30?
CAPCOM Your choice on that, CDR, you're ahead of the

timeline right now.

SC Yeah we're - we're going to press on slowly
through the system, perhaps for Depress set and just to make sure
we don't run into any problems there, and we'll probably - probably
call a pseudo hold before I take a check there, or take a
look at it.

CAPCOM Roger.

SC Oh, okay. Yeah, let's go ahead. Okay, and
there is that. (Laughter) I think I ought to hear that one. I
guess I can pretend like hear it. Make sure I'm in audio tone, but
I don't think it makes any difference. I don't hear a thing.
Houston, any suggestions in the suit pressure alarm on?

SC And no tone.

SC I didn't hear a Houston. (Laughter)

SC Hello, Houston, America.

SC I hear you guys, though.

CAPCOM America, Houston. Just for your information,
we've got the TV and we see the floor.

SC Okay, Robert, I just turned on the suit pressure
alarm, and no tone. Seems like I should get a tone there. That
right, Jack?

SC That's what he said - verified.

SC Hello, Houston, America. Did you get that
last?

CAPCOM Roger, that's affirmative, and you should have
gotten a tone, and we'll let you try it again. And we're thinking
it through right now.

SC Nothing. (Laughter)

END OF TAPE

SC LSC now.
SC Houston, you got a circuit breaker or two we could check on that one?
CAPCOM Affirmative, and we'll be right with you with it.
SC Okay.
CAPCOM Ron, you might go over on panel 5 and check the instrument SCI equipment hatch circuit breaker. That has to be in for the tone to work.
CAPCOM America, Houston.
SC Okay, Houston. It's - the hatch circuit breaker is in and - couldn't be my head set at all, could it?
CAPCOM I wouldn't think so. Not your head set per se since you're reading us and all.
SC Yeah, that's what I'm thinking, too.
SC Say, Bob. How would it be if I just plugged into the comm cable on umbilical just to check out the entire suit - head set system here on that too?
SC You just cut out. (garble) here.
Okay, see you after I go off the line for a minute.
CAPCOM Ron, you might verify that the non-essential BUSS switch on panel 5 is on MAIN A.
SC It's an intermittent in my head set.
CAPCOM Okay.
SC That's verified that Ron thinks he has an intermittent in his head set for some reason.
CAPCOM Ron, your transmissions are okay and you're not breaking up to us. It may be in your head set.
SC Okay, Houston. Gene's able to hear the tone. Ron's getting it intermittently.
CAPCOM Roger. We copy.
SC How about switching head sets with one of you guys, huh?
CAPCOM If you decide to swap head sets we would prefer that you swap with the CDR.
SC Any special reason?
SC Yeah. Yeah. Yeah. Oh this, oh, I see. I'll trade with Jack, here. Bob, this is CDR, have you got any answer to the last question.
CAPCOM Roger, CDR. It's almost a toss up but we would like to have the other man out on with an absolute good head set, although we don't think it's a real problem one way or another.
SC We'll get him out with a good head set.
Okay.

CAPCOM It's a toss up - CDR take your pick,
I guess, over.

SC Okay, stand by. We'll check one out
here. Okay, we just made a swap. Okay, Ron is wearing
Jack's head set and he's got a good talk continuing when
the switch is on and he loses the talk when the switch
goes off. We've got CMP and LP made the switch.

CAPCOM Oh, Roger.

SC Oh, that. I didn't - yeah - I didn't
- I didn't even know you could cut it off. If I'd known
that I'd cut it off before. Yeah. If I'd cut it off like
that I'd have my curly locks hanging out the front.

SC Hey, Houston, this is the LMP. Give
me a call,

CAPCOM LMP, Houston. Read you loud and
clear. How me?

SC Okay, you're loud and clear.

CAPCOM Roger, Jack.

SC We're going to try the spacecraft
suit. Jack, here is the spacecraft donor. He's turning
the power on and off - plus one power. I got it done.
Hey, that looks good now. Okay. Alarm is off.

SC Okay, Houston. We're going to turn
the TV off for awhile.

CAPCOM Roger.

SC Okay, I'm going to start my maneuver
now. Ha dit ta dee da dee dee dee dee.

END OF TAPE

SC 351, okay. The cabin repress valve, Okay.,
 okay, I'll get it.

SC Okay. Cabin repress valve is OFF on 351.
 And verify closed.

SC Yeah, that's right. They're tickeling.
 SC Okay, C2 heaters trim are in auto. Engine -
 SC Yeah, that's a good number.
 SC Okay. Got it. Yep, it's off.
 SC Okay. You on or -
 CAPCOM America, Houston. We'd like OMNI Delta,
 Omni Delta.

SC You've got it. Yep, got it in there. Okay
 PCV is verified on. Okay. Yep.

SC If you decide to put this on later, you can
 put it on for me, but it flops all over the place down here.
 Okay. It's Red ECS O2 hose. Okay. Pull the old purge
 valve. Valve 2 OH. It came from the Taurus-Littrow landing area
 of the Moon. Okay. Got purge valve. Boy. Okay, let's
 look at (garble). (Laughter) Okay, it's sloped, is it.

CAPCOM America, Houston, we are OMNI, Charlie.
 SC Yeah, you can't see it.
 SC You're OMNI Charlie now.
 CAPCOM Thank you Jack.
 SC (garble).
 SC (Garble)
 SC What's the matter - I'm going to try the
 other one, that thing I can't even move.

SC Ah. Sticks or something. Okay. Let me
 try the other one.

SC Yeah, this one's stuck here, stuck in some-
 thing. Couldn't move that if I had to. Okay, we'll use 211
 instead. Okay, Houston. He's going to wear purge valve 211,
 that's not perfectly matched but, I see no problems with it.
 It's a lot freeier.

CAPCOM Roger, America. And we anticipate no problems
 with using 211.

SC Okay. Fine Bob.
 SC Okay, we want it low, you said, Jack.
 Okay.

SC (Garble)
 SC Find, okay, it's low. Okay.
 SC Okay. 302 suit flow off. Might just as well
 (garble).

SC I turned mine off, see it.
 SC Okay.
 SC Good enough?
 SC Step in the tunnel, that way.
 SC Yep, this other way. You're in the way there,
 let's go the other way.

SC Okay, like so.
SC Okay, CMP hoses are routed up across the tunnel and out of the way, we hope. Ah, ha, finally getting some flow. Man, feel a lot better. Okay, cabin pressure's coming up. Okay. Jack, I guess you really could go to the LEB the LMP and help me, now.
SC Yeah, yeah, because I can -
SC Okay. I've got the flow coming in here, so, (garble) are up around 5.7.
SC Okay, just a second.
SC Yeah, I just - okay, I see - below 2.5.
Okay.
SC Man, you guys got that thing dirty.
SC Here, let me get the hose out of here, first.
SC (laughter) Well, I just thought they were in there, I guess.
SC Yeah.
SC Close up the hole there next to the source pressure. Okay, let's see, I can button that back up.

END OF TAPE

SC Okay, Houston, we're at attitude - I'm going to
 configure the dap.
 CAPCOM Roger, America, we copy attitude.
 SC I'm getting all tangled up in the hose.
 I don't (garble)
 CAPCOM Okay, America. We're ready for the high
 gain PITCH 43, YAW of 262.
 SC Okay, in just a minute. Manual and wide
 PITCH of 43, YAW is 262, high gain. Okay, they want AUTO,
 now?
 CAPCOM That's affirmative, Ron.
 SC I started to go full scale, but - is
 that good enough?
 CAPCOM Ron, we needed full scale.
 SC Let me try it again, okay? I'll go to
 manual and wide -
 CAPCOM React and wide and then step it down.
 SC Okay. Ahah, it's working. Okay, you're
 reacq and narrow, now.
 SC Okay. There it went off.
 CAPCOM America, we see your cabin 5.4 and we'll
 keep an eye on it.
 SC Okay, give us a little call there ahead
 of time and I'll correct it.
 CAPCOM Roger.
 SC Okay, Jack you're squared away.
 SC Okay, Bob, I've got the proper jet con-
 figured and AG PITCH and YAW main B are open.
 CAPCOM Roger, and we would like to go back to
 AUTO on the high gain, and see if it holds the signal strength
 for us.
 SC Okay, you've got AUTO.
 SC Okay, Bob, I'll verify that all the
 head set switches are set as per 3-9.
 CAPCOM Roger, America, thank you.
 CAPCOM And America, your cabin press is at 5.6
 and you can crack the side hatch valve if you like.
 SC Okay. Get the old cabin pressure down
 here a little ways. That's about 5 isn't it?
 SC Okay.
 CAPCOM Ron, we're seeing 4.9 on your pressure,
 you can stop venting there.
 SC Okay, we're stopped.
 SC Okay, it's closed. (garble)
 SC Okay. Here, Jack stick that up there.
 SC Up left. Okay. That's right side up.
 Not yet, I haven't got them all on here.
 CAPCOM America, Houston.
 SC Go ahead, Houston, this is America.

CAPCOM Gene, you probably realize that the audio tone is a separate wire all the way to the ear plug, and that's why there's no problem - the LMP's got no problem.

SC That's affirm, we understand.

SC Yes, we understand that.

SC Okay, Gene, the bottom ones looks like the letters up, right?

SC Yes, okay, that works okay. Now, where, oh, there's the other one. Thought I only had 3 straps. Okay. Okay, I guess we're ready to strap this thing on, huh? Well, I've got to have that first.

SC Okay, there's the old - (garble) strapped on. Well, it floats around there a lot better than it did in the simulator.

SC Okay, Jack. Can you kind of steady it there. That's a lower? Yes, give me the lower one first. No, up on top - the other way. And then slip - Okay. And an upper one. Okay, need a left upper, there's a left upper. Okay, the next one's coming around this way. And the left arm's back over here.

SC Ahah, there's the old OPS hose. Okay it's installed and it's locked, everybody locked. Okay.

SC Okay.

SC Okay, we going to need that. Okay.

SC Should have done that earlier, it's under your deck now. Here it is - okay. Oh, okay. (humming)

SC Okay, Houston, America. The LMP is don-ning and (garble) now.

CAPCOM Roger, America.

SC You ought to be able to - The back is the part I can't reach right now. Yes, okay.

CAPCOM America, the cabin is at 5.6 if you want to vent a little bit.

SC Okay, I'll get it. Okay - locked. I'll get the back of it. Can you -

END OF TAPE

SC Can you verify you on alignment?
SC Yeah. I can see it.
SC Which one is what? Let me twist it
just a little bit. Okay, there we go. Engage, lock, Okay.
(garble). Yep. Yep. Nothing there, You're going to have
to twist or something. Okay, that's the back.
SC One is in there and then the other one
was stuck in that bungee there.
SC Here's one. In the tunnel.
Keep him out of the cabin, okay?
SC Take a look. It's about 5 1/2 minutes,
Gene.
SC Okay.
CAPCOM Roger, Gene. It's at 5.3. We're
monitoring very closely with you - if it helps you any.
SC Okay, very fine. I'm coming down very
very slowly on it.
CAPCOM Roger.
SC Gene, can you look on your left side
over there?
SC That's it. Just a second Gene hold it
there. (Garble) valve. Okay, wait a minute. Okay, let's see
your right okay. It's Off. Just tell me when you want it on
here. Okay, that's seven. Here your (garble). There's
you lock on that blue one. Okay, close. Okay that's locked
that's locked. Having trouble getting on our (garble).
This has been too much pressure let me push it on here.
Twist - might have known. As you lock let me see. Okay,
let's see your. There up on the right. That's 02 that's
lock lock. Okay, the blue one is a lock lock. Okay, that
pin is now locked in, the buck is locked in. Okay, and
your helmet - checked that one. Let's try it again and see,
moves that way doesn't it? Okay, it's locked. Let me,
wrong way (laughter).
SC Okay, Houston this is america. The
LMP and CDR are both got their helmets and gloves on and
all connections have been checked.
CAPCOM Roger, America.
SC It's open. Okay, it's locked.
CAPCOM America we are copying the cabin at
4.8. You can stop the vent when you get time.
SC Okay, that's Gene's closing the valve now.
SC Okay, it's closed and how are you reading
CDR on VOX.
CAPCOM Read you loud and clear on VOX.
SC Okay, fine.
SC Okay, now she's low okay.

SC (Laughter) yes, got to get the dust cover on the purge. Okay.

SC Okay, we're going to do an integrity check, Jack.

SC And, Houston, the CMP's connections are all verified locked.

SC Okay, going to integrity. Check.

SC Let me know when you get up there because I've got to turn my O2 off. Well, I guess I can see it from here.

SC Okay, suit circuit return valve is closed. Okay, it's closed. (garble) O2 is closed. What's suit pressure indicating over there, Ron, about 47 to 53.

SC Yes, it's about 50.

SC And, O2 flow is low isn't it? Okay.

SC Closed down yes. I just take it off of here, huh?

SC Yes, just right off there.

SC Okay, suit circuit return valve is closed. suit flow valve - you have it closed, Jack. Suit pressure is okay and O2 flow is less than .4. Suit test okay, I'm taking us up.

SC Okay.

SC Okay, we're in pressure and (garble) O2 is open. And, let me cycle this suit circuit return valve. Okay it's open, and it's closed.

SC Okay.

SC That's O2 flow. Okay. At 4 psi differential closed at direct O2.

SC Okay, I'll turn my flow off in a little bit, and keep the cabin flowing up so far.

SC Okay.

SC If it starts to get hot I'll turn it back on again.

SC Okay.

SC Okay, direct O2 is closed. Should take you up to about 4.5.

SC Okay, check your suit pressure. What are you reading over there Ron? Ron, what are you reading up on the suit -

SC Oh, I don't know about 8.5 or 9.

SC Okay, let's go. Okay, CR's at 4.25 increasing slowly. Okay, very good. O2 flow, Ron.

SC It's still off let's give it a chance to -

SC Less than .8 let's wait for it here.

SC So you got it (garble).

SC Yes, we're going through about 4.35 now.

APOLLO 17 MISSION COMMENTARY 12/17/72 CST 13:48 GET 256:55 950/3

SC It's up to about 4.4 or 4.5.
SC Let me know when it comes down there will
you.
SC Okay, it's starting to come down now.
SC Let, me know when it gets stable.
SC Okay, it's .6 right now.
SC Still coming down?
SC Still coming down.
SC Okay.
SC .55 it's .5. It looks like it's going
to stabilize right there just a little less than .5.
SC Okay, let's see if it stays stable for
about 30 seconds.
SC Okay.
SC Not to me.
SC Oh, to you - okay.
SC Still stay one.
SC It's coming down. You guys got pretty
good suits.
SC Yes, they are good as a matter of fact.
SC (Laughter) put dust in them and it makes
them good.
SC That's been around .3.
SC Houston, how does the suit circuit look
to you?
CAPCOM It's looking - -

END OF TAPE

CAPCOM It's looking real good Gene.
SC If you're happy, I better depress.
CAPCOM Roger, we're happy with it.
SC Okay. Coming down slow Jack.
SC Okay.
SC Okay. We're coming down.
SC Okay. Okay.
SC Okay.
SC I can't do that. It's going to have to
be (laughter)
SC Okay. Okay.
SC If you guys are coming down I want to
give myself a little air here.
SC Get some of that cold you were talking
about this mornig, Gene.
SC Yeah. It's quite cold in there.
SC Okay. We'll pick it up over here.
SC Okay, Bob, I'll pick it up on page 3-13
as soon as we come down here a little bit more and then suit
test valve depress.
CAPCOM Roger.
SC What's my next thing here? (garbled)
SC Yeah. We'll get your helmet and gloves on,
Ron.
SC Okay, and I can go ahead and start doing
that.
SC Yup, you sure can.
SC Okay, I don't know if Jack will be able to
get my helmet on.
SC Guess I'll need my gloves.
SC Ah, no hurry yet, I need to get the
helmet on first.
CAPCOM America, Houston. You asked for a
reminder you wanted to ge the waste management compartment,
then prior to glove donning that is your decision, your
choice on that.
SC Oh, okay.
SC Ron, can you see our circuit pressure
up there?
SC Okay.
SC Yeah, it's about 7.
SC Okay.
SC Cabin's about 5, or 6 or so.
SC My clean gloves all dirty.
SC Oh, oh, the water's coming out of that
thing.
CAPCOM Okay, Jack, I want to take us down the rest
of the way.

SC Okay, Houston, the depress valve - depress valve is OFF here and I can verify that we are in both on demand reg.

SC Yeah, (garbled)

CAPCOM Roger, America.

SC Yeah, that's that valve you just opened.

SC Yeah, just opened the waste fluidage vent valve.

CAPCOM Okay, Ron, you got the O2 on you, I guess.

Huh?

SC Yeah, it's still on.

CAPCOM Okay.

SC Yeah, I must (garbled)

SC Opposite in the way in the back here.

Squeeze down here.

SC Okay, I'll hold your OPS all the way.

SC I can't see where the

SC Okay, you're in the back.

SC Wait a minute. Wait a minute. Bags up in the (garbled).

SC Have to have a hold, okay.

SC The cable here. The cables a (garbled)

CAPCOM America, you're (garbled)

SC Okay.

SC Half a second here.

SC Okay.

SC Naw, your (garbled)

SC Wait a minute. Something's (garbled)

SC What in the world was in there? Every-time I look down you're (garbled)

SC You're just not getting the line to well.

SC Let's zip up the sides over there or something.

SC You're clear.

SC Yeah, that buckle. I hadn't thought of that That's the buckle on the OPS.

SC That's something that doesn't in - wait a minute. That's the engagement right there.

SC Yep.

SC I think that's it. Isn't it.

SC Did it lock? Double check it lock and double check it in engage mark.

SC Okay, that's the lock mark, isn't it?

SC Yep. Good.

SC Yeah, (garbled) Think you know how to get it.

SC I got to pull up on this side, Jack. You'll have to get it on the other.

SC Yeah, something's not right the way I
SC There. Okay, that's did it.
SC Here.
CAPCOM Okay, Ron, I want you to do a couple of
other things before you go any further.
SC Okay.
SC Okay, give me - pull the pin on the purge
valve and give it to me. And activate it in LOW. Okay, go
and activate it.
SC Okay. It's activated in LOW.
SC Okay, the (garbled) valve is verified the
vertical.
SC Okay in vertical?
SC Okay, that one is vertical. Next step is
not applicable.
SC Look at that (garbled)
SC How are you going to judge your PGA turn-
off?
SC And set your (garble) drain to the engaged
position.
SC Okay, that one's engaged. That one's
engaged. How's the noise down there, Houston?
CAPCOM Not to bad, Ron.
CAPCOM And the cabin is at 420.
SC Thank you, Bob.
SC And Houston, that CDR is on the cue card
now.
SC Jack, could you get his flap on the other
side?
SC Yeah, I got it, okay.
SC Sorry, I didn't leave you -
SC I got it on this side.
SC Okay.
SC Well, it'll do that to, that's - just
push it down behind the OPS here and that's about the best
(garbled) you can do on that. That cover on that -
SC Yeah. If it's to loose, you can pull
the tab and tighten it up.
SC That's all right. That's good. That's good.
That's -
SC Okay, Ron, you can -
SC A rock
SC I think we just found a sample of the
Moon floating around in the cabin. Hold it there please.
SC We can't go on to it now.
SC Just a second.
SC Let me look at that before you cover it.
SC Okay, that locked.

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SC That's locked.
SC Okay, your right glove is locked.
SC Yeah, I'm going to let you help me with
the - (garbled) put the strap on and - put it off - up here
yeah. I got (garbled)
SC Tip top. Pull the top.

END OF TAPE"

SC (Garble)
SC That's over, isn't it?
SC I don't want that.
SC (Garble)
SC Yeah, but it won't go over that other
valve, Gene, so --
SC Better get it under the gauntlet.
SC There you go.
SC There we go. It's over the valve.
SC Over the valve, okay?
SC Okay, your right glove is lock lock, let's
get your left one on.
SC Okay, she's engaged.
SC Check.
SC First, I've gotta turn the pressure off,
see?
SC Okay.
SC (Laughter) Okay, in 6003 EVA 02 off.
SC Okay, wait a minute, can't even reach it.
SC Okay, EVA 02 is off.
SC Check.
SC Okay, can you get your other glove?
SC Turn it some more. Turn it the other way.
Okay now.
SC She's locked?
SC Push her on up.
SC Okay?
SC Okay, you are locked.
SC Wait a minute, I'll get it. (Garble)
SC (Laughter) Okay.
SC Okay, fully.
SC Out of REQUIRE to PRESSURIZE.
SC Okay, we're coming up.
SC I'd like to get that gauntlet.
SC Okay.
SC Okay, the CMP is coming up.
SC Okay.
SC Okay, looks like about 3.4 -- 3.5.
SC Pressurized all right? There we go.
SC Okay, if you can reach the tone, turn
your tone on.
SC Okay.
SC And, verify and turn it off.
SC Hey, don't know how I'm going to reach
the tone.
SC Want me to help you? Wait a minute, see
(garble).

SC (Laughter) No, go ahead, I can't move.
SC Okay, wait a minute. Hook it in my
thing.
SC Okay. You want it locked in there?
SC No, that's all right.
SC Okay.
SC You ought to get that.
SC Yeah, that's true.
SC Hmm, I don't have a tone.
SC Turn it off?
SC Yeah, it's off. Stupid thing.
SC You got it?
SC You said you did not have a tone, is that
correct?
SC Yeah, that's right.
SC Houston, do you hear that?
CAPCOM Understand the CMP does not have his
tone again?
SC Ah, son of a buck.
SC Pretty good at this time.
SC Okay, I'm reading 3.9, should have low
suit flow because I got the purge valve.
SC Okay, you got your EVA -- pickup EVA 02
is on.
SC Is it still on, or you got it off?
SC 60202? Yeah, it's on. 02 flow is on.
SC Okay, and you're reading 3740.
SC Say again. Maybe it's just not -- maybe
it's still getting too much flow. The purge valve is open
in it to low.
SC Purge valve is open to low.
SC Did you open it? I think I did.
SC I think I did.
SC Yeah, it was open.
SC Yeah.
SC You're open.
SC Okay, turn the tone off.
SC Okay, turned the tone off.
SC Okay, it's off.
SC Okay, how's your master volume? You
happy with it? Or did you jack it up a little?
SC Houston, say something.
CAPCOM Roger, Ron. We copy you. You might try
and adjust your VOX -- thumb wheel down a little bit might help
us a bit, knock out some of the background noise.
SC (Laughter) Okay. Jack, you want to try
to (garble) the VOX down a little bit?

SC Okay, 1, 2, 3, 4, 5 -- 5, 4, 3, 2, 1.
CAPCOM Hey, you don't sound bad at all --
SC Houston, are you reading me?
CAPCOM We're reading you loud and clear, Ron.
No problem.
SC (Garble)
SC Okay, did that knock some of the noise
down?
CAPCOM That's affirmative.
SC Is that -- that okay? Okay?
SC You're going to get a little bit of noise,
I think.
CAPCOM Oh, that's affirmative. We realize that.
SC Okay, Houston.
CAPCOM Okay.
SC Okay, Houston, unless we hear otherwise,
without the tone at that point, we are pressing on.
SC Okay, Jack. On 351 get the emergency
cabin pressure rates off.
CAPCOM America, that's affirmative, and we'd
like to vent the cabin we're at 5.7 again.
SC Okay.
SC (Garble)
SC About 351.
SC Okay, Houston, I'm 351, emergency cabin
pressure's off.
CAPCOM Roger.
SC Okay, Ron. (Garble) Let me read this to
you. Soon as your monitor comes in, set purge valve high,
and verify tone on at 31 to 34. Then turn valve closed and
verify tone off. Go ahead, turn the switch on.
SC Okay.
SC You probably didn't get a tone there because
you were already on up to pressure by the time you got that
switch on. I think that's why you didn't get a tone.
SC Yeah.
SC So, you should get one here. So turn the
tone -- you got the tone power on?
SC No, not yet. I can't get down there.
SC Okay.
SC Not until you get Jack out of the way.
SC Okay.
SC Okay.
SC Okay, get down there and turn the talk
power on. I think you'll get a tone this time around.
SC Okay. There.
SC Okay, tone power's on. What I want you
to do is go pur -- go high on the purge valve (garble).

SC I'm gonna let you -- I'm gonna let you
do that, okay?
SC Okay. Now, it's high --
SC Okay, coming up.
SC -- 31 to 34, you ought to get a tone.
SC Now, I got the tone. It's 32.
SC Okay, turn it back on. (Garble)
SC Wait a minute.
SC Purge valve is closed.
SC Okay. Back up to 4.
SC Power off?
SC Power's off.
SC Okay, purge valve is locked, and it's
high.
SC Locked and high, okay.
SC Yeah. That's where you want it, huh?
SC Right.
SC Why don't you come up here, and I'll
install a pin for you.
SC Yeah, I'll come up there. (Laughter)
If I could.
SC I can get it.
SC Gonna do it?
SC Yeah, I can.
SC Okay.
SC Okay.
SC Okay.
SC Now, it's locked, the pin is in, and you
are in high.
SC Okay, that's verified.
SC Okay?
SC Okay, verify small cuff gauge reads
37 to 40.
SC Ron?
SC Okay. There's a 3.9 on the cuff gauge.
SC Okay, we're going to do an integrity
check on you. It's 603 EVA and Station 02 off.
SC Okay. Can you reach that gauge, or do
you want me to?
SC Oh, I can get it. Get it if I turn
around here. I'll get it. (Garble) Let me undo this before
I pressurize, and I'll strap 'em in again.
SC How you guys doing?

END OF TAPE

SC Oh, I've done it before. I must be lying
in the way here.

SC I get it off?

SC Okay, got the tone.

SC Okay, now.

SC Okay, monitor cup gauge, verify PCV closes.
Monitor pressure decay for 1 minute, verify lesser point 8.

SC Okay, closed and we're at 3.61.

SC Okay, when did you start your time?

SC Okay.

SC Can you guys hear that tone?

SC Yes, I can hear occasionally.

CAPCOM That's affirmative.

SC Oh, you can hear it on the ground, huh?

CAPCOM That's affirmative.

SC Very good.

SC Okay, Ron, how is, how is your suit pressure?

SC Suit pressure is stuck at 3.6.

SC That's a good place for it to be. You have
about 30 more seconds, don't you.

SC No. About 15 more.

SC Okay.

SC Okay, and you did get the tone on for low flow.

SC Yes.

SC Let me know when you're satisfied with the time.

SC Okay, turn it back on.

SC Okay. 02.

SC It's on and let me get this all the way up. Is
it all the way up?

SC Yes. I think it is. I can see it increasing,
and I'm getting ready to push it. Put your guards down.

SC See anything?

SC Okay. Okay.

SC Okay, you happy?

SC Yes 3.7 to 4.0 stable?

SC Stable 3.9.

SC No tone?

SC No tone.

SC EVA pressure gauge 100 to 500 psi.

SC Yes. For some reason, the battery is burned
out in the flashlight. Let me see, it's about, I would say 400,
I think. Yes, let's see, it's division marks on that gauge are
36 and 900. And it's above the 3 ...

SC Yes it's good, I can see that.

SC Yes, that's it. It's about 350. Okay, verify
surge tank pressure. Houston, can you give us a hack on the surge
tank as we go.

CAPCOM Stand by on that.

CAPCOM Roger, it looks good.
SC Okay, very good. We're ready to press on with
the cabin depress, Ron. GN-2 valve handle pulled.
SC Okay, we'll pick that up when he starts to move.
Okay, gauge min, and leave it in that position. Pull the handle
Leave it there. Okay, Verify helmet and gloves are locked.
SC Okay. Looks smooth. Here, I'll need to get that
down.
SC Check.
SC You look, look, hey babe you looked good when
you went by me. Just stay that way.
SC Will stay that way. Okay Houston, we're
standing by for your Go.
CAPCOM You're Go.
SC Okay, Ron, here's a note.
SC Okay.
SC EVA warning tone may come on momentarily during
the depress.
SC Okay.
SC Jack, are you ready.
SC Okay, babe, when you get out there, just take
it nice and slow and easy. You got all day long.
SC Yes, that's right. Not like the zero-g airplane.
SC Feel yourself around, and it's nice and easy to
get around, just don't let your body start moving too fast down
there.
SC Okay, side hatch coming open slowly.
SC Or the valve's rather.
SC I can't see the gauge, but I know we're coming
down.
SC Okay. Houston, can you give me a hack at
approaching 325.
CAPCOM That's affirmative. We will.
SC Okay.
SC Okay, that's O2 flow high as expected.
SC Okay. And that's oh, about 395?
SC Okay.
SC Coming down a little faster Houston.
CAPCOM Roger, we're watching.
CAPCOM And Ron, when you get to the SIM bay, don't
fool around ...
CAPCOM 3.4 Gene.
SC Okay.
CAPCOM 3.3 closing.

SC Oh, okay, will do.
SC Get your feet in the golden shoes, and then you
can do anything. But get them there first.
SC Okay, 3.25, O2 flow indicator is off scale low.
Okay, can you verify our suit pressure down there?
CAPCOM Rog. You're locked up suit pressure 2.8.
SC Okay, very good, We're coming all the way open.
Going to zero. You guys ready. Here we go.
SC Okay.
SC I don't change. I'm already there.
SC Yes, but Jack and I are coming up.
SC Yes I know.
SC Okay, we're coming up.
SC Okay.
SC Nice day for an EVA, Ron. Go and have a
good time.
SC Yes. It ought to be pretty good out there.
SC Okay, we're coming off the peg.
SC I just need one visor down, don't I.
SC No, you need you Sun visor down, to bring, one
is protective, and the other is the Sun.
SC It is?
SC Well, it looks dark out there. Can't even see.
SC Well, use your own judgement. If you're in the
shade, you won't need them. If you're in the Sun, you ought to have
it down.
SC Okay.
SC Okay, Jack. I'm at 2.8 and coming up.
SC Okay.
SC Well let's open her up a little more.
SC Okay, the valve's all the way open. And I'm 3.5.
SC Okay, I'm still reading about 382 now.
sc O2 flow high light is off. Wait until we're
stable Ron and we'll be with you.
SC Jack, it looks like I'm peaking out, peaking out
of a 3.75. How you looking.
SC Okay, Ron, you're 3.7 to 4.0.
SC Yes, I'm 3.8.
SC Okay, EVA station pressure gauge still up.
SC EVA station pressure gauge - I can't see it.
SC Okay.
SC Still have about a third
SC You do not have a tone, right?
SC No tone.
SC Can you get panel 3 S-band AUX TV to TV?
SC Okay.
SC If you can do it.
SC Big red bag in the way here.
SC Okay, TV is going up to TV.
SC You got it.

END OF TAPE

SC Got it?
SC Yep.
SC Okay, I've got lines on the monitor, and
he's doing the PDR's on the ICS, PTC.
SC Roger, CM.
SC Okay, Ron, we're ready for the hatch
opening. The lock pin release valve unlocked.
SC Okay. Lock pin release valve in the one
on the side, push it down to yellow, right?
SC Unlocked indicator release white goes
to yellow.
SC White goes to yellow, okay.
SC Gear box selector unlatched.
SC Gear box to unlatch.
SC Actuator handle unlatch.
SC Actuator handle to unlatch.
SC Let go actuator handle.
SC Okay, let go the old actuator handle.
SC And the hatch is yours.
SC Okay, here we go. 1, 2, 3, I got a
hold of it. There's a bunch of trucks going out there.
(laughter) Oh, there goes the pen. (laughter) Got that.
That was a felt tip pen. (garbled) (laughter)
SC Say, Ron, now you want to actuator handle
select lock to L.
SC Okay, wait a minute. Actuator handle
to latch. Okay, she's started. (garbled) There it is, okay.
There we go.
SC Okay, now it's closed. Okay, gearbox
selector to latch
SC Gearbox selector to latch.
SC Okay, and you and Jack can both lower
your inner visors.
SC Okay, inner visors lowered.
SC Okay, open hatch slowly and verify that
our X clears.
SC Okay, Houston, the hatch is open.
CAPCOM Roger, America.
SC Hey, there's the Earth right up ahead.
SC Okay, Rog, you got a -
SC The crescent Earth.
SC You've got a go for egress.
SC Beautiful.
SC Okay, and just take it slow.
SC Okay, first of all I got to get back and
get the old TV camera. Ops. That's right I don't know where
the sun is. Which way is the Sun? Okay, Sun's on the right.

SC Okay.
SC And Ron's putting the camera out there
on the pole now. Pole out there rather.
CAPCOM Roger. We see the EVA light out there.
SC Stay lower.
SC Okay.
SC That Sun is bright. Whoooo.
SC Pull down that visor, Ron. You're going
to need it.
SC Yeah.
SC Not the metal one, unless you really
need it.
SC No I don't want the metal one.
SC No just get the gold one. That's all
you need.
SC Okay. Try this one.
SC Okay, you're clear back here.
SC Ah, man. We're about to get the old TV pole
in there. Lined up. What's in there. Forgot to turn the
camera on. Hand back the -
SC Sequence, here.
SC Let me get the (garbled)
SC You're a long way from home we don't
want to loose you.
SC Okay. I'll start the - I think I hear
it buzzing. How's the TV picture, Houston?
SC Really great, Ron. Looks great.
SC Okay. Hey, I see what you were talking
about Gene, on this blister. The band's really blistered on
it. Like (garbled) That a good one? Okay.
SC If we're cleared to go down and get the
old lunar sounder cassette, huh?
SC Okay.
SC Okay. And I got my foot hooked to some-
thing. Which way do I need to go?
SC There we go. Okay. How's that?
Okay? Blowing?
SC Can I go now?
SC Am I clear?
SC You're clear, Babe, go.
SC Okay. Hot diggety dogs.
SC Okay, did you see an E dot.
CAPCOM Roger.
SC Am I on the tube?
CAPCOM That's affirmative.
SC Okay.
CAPCOM Outstanding quality picture, Ron.

SC See me wave?
CAPCOM That's affirmative.
SC (laughter) Okay. Beautiful. Hey the paint on here is just a - silver paint, and it's just little blisters on it is all. You can just kinda peel it off with your fingers. Yeah, it rolled off the other way. I can see the Moon right behind me. Beautiful. The Moon is down here to the right. Full Moon. And off to the left just outside the hatch down here is the crescent Earth. Maybe I can get a picture of the Earth as I'm coming back in there. But the crescent Earth is not like the crescent Moon. It's got kinda like horns and the horns go all the way around, but they make almost three-quarters of a circle. Hey, that last mapping camera retract must have worked because the door is closed and everything is closed up.

CAPCOM Say, Ron, you did get the camera? Right?
The DAC on.

SC Yeah, Ken DAC's working -
SC Okay, you're go to transfer to SIM bay and get in the foot restraints.

SC Okay. Here's a piece of the thermal blanket from the sim bay jet. That of interest. They're just kinda laying there underneath the EVA handle.

CAPCOM Roger, we see it. Confirm.

SC Okay. But it's a pretty clean cut from the SIM bay itself. That's just a piece of that thermal blanket that's sticking around there. Man, it's black off this other way. The pan camera lens is all (garbled) (singing) Okay. (singing)

END OF TAPE

SC I almost had my foot in there, then the cable was between my foot ...

SC Get it.

SC Okay, I having a little trouble right now just torquing down to get my foot in the foot restraint, for some reason.

SC Yes.

SC No, not yet.

SC Okay. Okay, the right one's in. And the left one's in. Hey, pretty stable right here. Let go of both hands, see?

CAPCOM Roger. We see you waving.

SC Hey, this is great. Talking about being a space man, this is it. Okay, back to work. This is a little stiffer, I think, or something than normal. Okay, let's try to do a little (garble). Oh, the (garble) is still there. Okay, here's the (garble, garble) and there is goes. Okay, before we do anything else here, I guess we better, better hook the old tether on the thing. Okay, tether is on. is this the end of that? Oh, okay. It's nice and white down here, the UV cover's closed real well, doesn't seem to be any (garble) at all on the white phase, on the UV or the IR. Everything is in good shape. Looks like part of that cork insulation tipped off again down here in the corner that I'm looking at. Okay, let's try the old cassettes. We'll push down on it until it goes past center. I think that was 2 pounds of push, but it came out. And cut the film. Okay, she's locked in there. These EVA handholds are, the EVA handholds are, okay got it free, are rougher than, (garble), oh, that was my pocket, and it creates a torque, when I let go of that pocket there, I let go with a little bit of a force, and the force has a tendency to throw your feet way up in the air.

SC Keep talking Ron. I'm walking that one with you.

SC Okay. Coming right back. Oh, my feet are bouncing up in the air again. Shouldn't be, yes, can you do it? Oh, I hope I don't hit the end of the (garble) again. Yes. See, you put yourself down there, and then you got to twist to stop, or, or it, (garble) and you bounce back up in the air again. Okay, there comes some of the paint. Oh, we'll get attached to the thing on there, before I take mine off. Okay, comes the old cassette. Yes. That close enough Jack, or you want a little closer? Okay. Yes. Look for craters. Yes (garble, garble) that way. Okay, you got the old lunar sounder cassette.

CAPCOM Okay, Ron, you're GO to get the pan camera.

SC Pan camera's next, huh?

SC Got a couple of hard covers don't forget.

SC Yes, there's a couple of covers on it.

SC You know, the old EVA (garble), I thought when I

SC was looking at that the other day, it depended on what kind of light you're in, it looked like it was burst a little bit. And sure enough it is. Okay, now let's see now, which way did I turn on this thing. Just go backwards down here. What the heck? Okay. Oh, how we need to get that big old pan camera. Oops. Okay, locked in there and you can relax a little bit. Let's see O2 pressure is, must be breathing a little bit, it's up to 40.

SC Houston, this is America. Everything is looking good from here.

SC Houston, this is, let's see when you're EVA, you use your name, don't they?

CAPCOM Okay, Ron. Yes sir, we'll use it Ron.

SC Houston, this is Ron, okay?

SC You hear me okay, I guess, huh?

CAPCOM Roger, Ron. We read you loud and clear.

SC Okay. Oh, this is great, whoopee.

CAPCOM Yes, we thought it was Mr. America.

SC Well it is something like that. Oh boy, beautiful Moon. Full Moon down there. Runs back of what. No you can't see anything. The only thing I can see is the SIM bay. I can see the engine valve sitting back here. That's a pretty good sized thing too and of course, the UV, the VHF antenna, it's still sticking up there all of the, all of the poles are on it, so it's working allright. Oh, it's a little bit of a (garble), just pull the old metal thing off here. Oh, (garble). Can you see that? The thing I'm holding up. It's the cover on the outside of the pan camera. It's a thermal cover, see it covers up the cassette. Ah.

END OF TAPE

SC I'm out in the shadows. There we go.
Yeah. Say that's right. It's the thermal cover that's on
there and then that's the

CAPCOM Roger, we see a lot.

SC Whooooooo. Okay. Well, let's see. Ohhh
there's a pan camera cassette down there.

CAPCOM We just saw that covered.

SC Okay.

SC Okay. Let's see that hooked down. And lock
it. (garbled) Okay, it's locked and won't come apart.

SC I say, where's the old pin. There it is.

SC Okay. Here's a bolt. Frees the handle.

And out you come. I didn't even use the (garbled) the heavy son
of a gun. Not heavy up here, it just has a lot of - momentum to it.
Once it starts going in one direction, it takes a lot of force to
stop it. And we'll just try and oops, there's a - rest of -
it there we wouldn't want to do that. Let me get this thing fixed
and then put up. I did. I think I'll just kinda let this thing go
and hang on with both hands. Get it started right in front of me.
Have to look the best way to see that one. Okay. Just kinda
floating around up there. Oh, Peter Pring, you okay?

SC And it's trying to come along with me,
I just learned to do that. You she's just floating there.
Okay. Coming. Still coming. Brought the bag behind me.
That's good. Nice and slow. Cause you don't want that
thing banging around to much up there I don't think. Ahhhh.
There it is. (garbled) That's the way it
ought to be done, isn't it? Okay, you going to watch. Yep.
Okay. Got hooked on my French (garbled) my cuff guard.
(laughter) Okay. That's a good idea. Boy, that Sun's bright
when you look into it. That is a biggy. (singing) You know
I just kinda looked along underneath me, you just go
backwards down there. (singing) That's an unorthodox way
to enter the SIM bay, but it works. Okay. We'll leave
(garbled) up. Ah, okay. I'm going to rest when I get my
feet in that thing. (garbled) right there and take it
nice and easy. Yeah, once you get your feet in there it
(garbled) - ya'll don't feel like may or might come out.
(laughter) So, I'm not sure you really trust 'em. Ahhhh, the
right foot (garbled) Yeah. Hello. Mom.

CAPCOM We see your act. Looking great.

SC Told you. Hi, John, and
how are you doing? Hi, Jimmy. Let's see. I'm supposed
to rest, aren't I? What would you like to know about the
SIM bay? Looks great. (garbled) I was kinda surprised when
I saw on this mapping camera there was two - oh, one
just kind of a steel plate there, and right on top of the door,
there's something with a piece of tape on it. And I thought that

piece of tape came off before launch.

CAPCOM Ron, just a couple questions while you're standing there resting. Is there any damage to the cable that the mapping camera - the cable between the mapping camera and the shelf?

SC Let me check on that one.

CAPCOM Don't move and look at it. It was not that important. If you can see it fine. Otherwise forget it.

SC There. Okay. Oh, I'll kinda take a look at it when I go by. There's Jack. Hey, how are you doing? You're looking (garbled) and I'm looking right at you. I should have a camera and I could take your picture. And see the Moon back over there? Well, that's the way it goes. Ah. Man, it's clearer down here when you take that visor up. I hope I took the outside one. I mean the full one. Naw, that's both of them. Better leave it down. Ahhh, there we go. Yeah, you take the outside one up a little ways and then you can really see down into SIM bay. You know that tape down in here, it's not scorched one bit. The whole side of the spacecraft is scorched like a son of a gun. But the - you know the panels and everything. Man, there's bubbles on - all that silver paint that's out here - is, you know it used to be kind of a bright looking silver paint. It looks like, it's in a shadow right now, but it looks like it's just been heated up. Ah, one way or another. Yeah, that's up here between the SIM bay and the top of the service module it actually looks like it's been burned. You know. Not just a little bit warm it's just kinda firm because it's bubbled. Yeah. That's what (garbled) did from the LM I'm sure. And, but, as far as I can - it's kinda dark down the other side of the spacecraft - the other side of the SIM bay, but it looks like the thrusters don't make any - hardly any mark on there. I'm looking at the side of quad 8 thruster, and it's all scorched. I'm not sure but what that might have been - what in the world would do that? Power jet suppose? I don't know. Might have. Well, let's take one of these covers off.

END OF TAPE

SC Look. This is like you see it in practice.
(Laughter) Stick it underneath the door. Looks like I'm jerking on it a little harder up here. In practice, I didn't want to break it. There's -- a part of the -- could you see that one?

CAPCOM Roger, we see it. Looks like the outer space Olympics going on up there.

SC (Laughter) Hey, this is great, I'll tell you. And, let's see which way it'll flip so you all can see it down there.

SC That's good. That's real funny.

SC Okay. Look.

CAPCOM Rog. We see it reflecting off in the distance.

SC Did you see that one? Okay.

CAPCOM Never did that in the water tank.

SC (Laughter) Yeah. That's the little -- the Mylar. It's the tinfoil that they make the LM out of, you know?

CAPCOM Roger.

SC (Laughter) No, not really. They also (garble) insulation (garble). And, here we go.

SC If that's what they made the LM out of, you'd never be able to pull it apart, I'll tell you.

SC (Laughter) That's right. I -- I'm joking about that, you know. I'm really joking. Fellows, it was a good vehicle.

CAPCOM We'll send your apologies to Bethpage.

SC And (laughter) -- No, I guess Bethpage knows I'm joking, you know. Let me see. Hey I want to make sure I get this on the right handle there, don't I? Gee, that's a lot of world to watch us, and I forgot the starter. (Laughter) Okay. Forty minutes, huh?

CAPCOM We've got you 35 minutes -- 36 minutes, Ron.

SC Oh, okay. Oh. Okay. Yeah, the EVA light's kind of blistered, also. No, they're right behind, toward the Sun. Looks like there's hooks on there now. Hooks onto the cassette. No, maybe that tape's supposed to be on that pan camera, I'm sure. But, the old door's back in there real well. I don't know what -- what would cause that thing to -- well, they weren't expecting those four minutes anyhow. Ohhhh, there's the old Mappers' cassette. Well I'm -- supposed to pick it up aren't I. I want to take a look down in there. Uh, can't get out that way. (Laughter) Got a locked foot in there and you can't go out in the left direction with -- with my foot in there. You have to lean over to the right a little bit to

get your foot out. (Singing to himself) Yeah, nice and clean down there. That cable's in the clear. I can see down in there. There doesn't seem to be anything hanging up on it at all.

CAPCOM Okay, Ron, good show.

SC Okay. Put the old foot binder down now. Woops, come back here, little cassette. (Singing to himself). I was going to try to lift that door up, but it's sort of got an angle on it, and it's stuck down in there anyway.

CAPCOM There's no requirement on that, Ron, no requirement.

SC (Laughter) Okay. Check one thing while I'm out here before I leave, to see the bottom of this Quad A. Forgot to look at it. Yeah, it looks just like the side almost. More blistered on the side than it is on the bottom, but I think maybe it's just the paint.

SC Okay, I'm coming back in.

SC No, I'll get it. Okay.

SC Boy the RTV is good out here. Looks brand new. Whatever they put on the hinge -- looks like that RTV stuff, huh? That's why they seal around all their doors on here. And, it's spanking clean as ever. (Singing to himself.) Okay, no hurry. Think. What's -- ha, outstanding. Once you get stable, in a position; see, I can pretty much hang on with one hand, and I can twist -- oops. Yeah, once you start going, its a son of a gun to try, it's all wrist action (garble). Yeah, but once you get stable on this thing, you kind of relax there and -- yeah, you're through. And, if I ever banged my foot against something, just barely touch it, and it bangs right back. And, -- Hey, America looks really great there. Still got that silver tape on it. Or is it blue? Looks silver with this helmet. Let's see, I've got to get over this way further this time, don't I? Okay. There we go. Hey, I got a picture of the waste water dump from the LM the other day, but it looks the same way now. There's all kinds of little ice particles all around the periphery of the dump nozzle itself. It covers up the kind of gold parts that's on the end of the dump nozzle. Then, there are little particles of frozen water, I guess. Must be. They're all over up the side of the spacecraft there, but only in the vicinity of the nozzle. It goes up just about to window Number 1 -- it goes up to window Number 1 -- well, maybe on up to -- no, there's particles all the way up the side of the spacecraft -- clear up to the top of the tunnel. But, they're real fine. I want to see if there stuck on there. Hey, you just touch them, and they blow away. They're just little ice particles.

SC Okay, Houston. We got all three cassettes this side.

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CAPCOM

Roger. Good show.

SC

Hey, here's something. You know, the
one thing that really shows up and makes you kind of proud --

END OF TAPE

SC Says United States, and it's got a United States flag right below it. That didn't even get scorched or a darn thing. That's great. And, let's see now, I see what Charlie Duke meant. Man, it's dark out here. It is really dark. The scimitar antenna, right there - no shake - no problem. Wish there were some more handles I'd go around the other side of the spacecraft. Take a look at the high gain. There aren't any more handles.

CAPCOM Okay, Ron, we don't need any more Spacecraft commentary. We'd like you to go ahead and terminate the EVA. You're looking great. Everybody's really pleased and we'd just like to go ahead and terminate.

SC Okay. Sounds good.

SC Okay, Bob, we'll get back in.

SC How's that?

SC Okay, I guess we'll - start getting back in then. Come up below the camera right now.

CAPCOM Ron, you'd be happy to know on the TV we got a great view of your OPS with the United States flag on it.

SC Hey, beautiful. Perfect.

SC Let's see, which way do I want to get the umbilical down there? Ah, the amateurs pulling me sidewise, Okay. That's right. There, okay. No, that's all right.

SC Okay.

SC No, that's right. You are in good shape. Go ahead and start pulling in.

SC Wait a minute Ron, until we get Jack in the right place.

SC Okay.

SC Where?

SC Yeah, pull up on that one.

SC Come on in.

SC Okay.

SC You coming in head down or up?

SC This way right now.

SC You can't close the hatch that way.

SC I know it.

SC Not yet.

SC What does that look like on the monitor?

CAPCOM Well, you should have - test me and I wouldn't want to guess. It's probably the full Moon, isn't it?

SC It is.

CAPCOM You taught me well Ron. Taught me well.

SC Okay, you got - (garbled)

SC Okay, and I'm going to arc it around and (garble) See if I can turn around here anyway. Yeah, I am. Trying to anyhow. (garbled)

SC (garbled)
SC No, I'm not.
SC Yep. I'm afraid I can't get through it -
can't quite. Okay don't do that to much.
CAPCOM Okay, Ron, we know what you've been
through and we appreciate the TV show that looking - started
to be a go, but we'd like to terminate.
SC (laughter) We're terminate.
SC Yeah. We're terminating.
CAPCOM And you might be advised you're right on
the flight plan, you're right on the flight plan.
SC Oh. Okay. Good. I didn't want to get
- cut my time short any you know.
SC Ah, unless you can set it way back
there. Okay, then I'll keep it right here.
SC Ah, sure Geno, we can shove it underneath
your couch.
SC That's the best place to shove it.
SC Can you do that? I'll get up out of your
way here.
SC Kinda good. Let me get out from under the
(garbled) Okay.
SC And, if you can get the TV switch there
Jack, that kinda saves - all the time I guess.
SC If you can't, I'll get it when I come
in.
SC Okay, and I got it off up here.
SC Okay, your in standby. That's all.
SC Okay. We'll have to come in there kinda
a little bit blind because - in order to get in I got to look
at the Sun. So just kinda point me in the right direction
there.
SC (laughter) Okay, wait a minute. One of
our - kleenex's that we're using to wipe the windows with is
stuck in the air vent. (laughter)
SC There goes.
SC Okay.
SC Okay and back on down.
SC Well, let's see. Back it down. Let me see,
which way do I -
SC Straight down.
SC Okay.
SC I got your leg.
SC Got my leg.
SC Okay, on the left make sure that the -
SC Wait a minute. Wait - somebody got my
leg or what.
SC Just kick it down, you'll be free. Kick
your right leg down -
SC Ah, there we go.

SC Okay, ---
CAPCOM (garbled) the scissors when out the hatch.
Is that affirmed?
SC (laughter) I didn't see a thing.
SC You blew it. Let me get your umbilical.
SC The only thing I saw drop was the -
SC Say Jack,
CAPCOM Ron, Rcn, how's the hatch? Get down
on the hatch. Your OPS isn't getting through the top. Pull
yourself down. Straight forward. Face down. Nose down.
Now back.
SC Okay. How's that.
SC Now back. Keep coming. Keep coming.
Now can you reach the hatch?
SC Yeah, makes sorta (garbled) Let me get
back in a little bit.
SC Okay.
SC I'll get this visor up. Don't want 'em
anyhow.
SC Ah, that's a pretty Earth up there.
SC Think you're one of the (garbled)
SC Now, does the seal look good to you while
you got your nose there?
SC Yeah. Wait a minute. What's that stuff
on the window?
SC Stuff going out the window there.
SC Ah. Okay, it's clear.
SC Okay. You don't have to look.
SC Take that back.
SC Okay, now I think we (garble) it out of
the hatch.
SC Okay.
SC The reason we put that -
SC Okay.
SC Can we get rid of the -
SC Instead of pulling the (garbled) pin we put
this little (garbled)
SC No.
SC And pull. Here she comes.
SC Okay, and I'm already back inside. It's
dark in here.
SC Okay. When you made your first turn you
got a full light.
SC Wait a minute.
SC Just get a couple turns on it.
SC Okay there's one turn on it. I mean -
I can release it.
SC Okay, now get it back.

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SC It's a little harder to pull shut, Gene.
SC Ah, it's coming.
SC Ah, so it was.
SC That's as far as it will go.
SC See, does that line up - (garbled)
SC The hatch is clear now we're in good shape,
close the hatch you're

END OF TAPE

SC (Garble) Pull the hatch in.
SC Okay.
SC Verify lock pin dropped in white to white.
SC Yeah, okay, we're white to white.
SC Okay, stow actuator handle, actuator
handle in to stow.
SC Actuator handle is (garble) and it's stowed.
SC Okay, you still got white to white?
SC I still got white to white.
SC And, the dogs over here look good to me.
SC The dogs look good, let me see if my pencil
mark is on that thing.
SC Yes, they're lined up.
SC Gear box selector latch.
SC Verify.
SC Gear box selector is verified latch.
SC Okay. Cabin repress.
SC Wait a minute, I gotta close -- oh, okay,
now I --
SC We're just starting. Cabin repress, okay?
SC Okay. (garble).
SC Sdehatch dumbbell closed.
SC Okay, we're closing it.
SC Hey, it's funny. We didn't see anything
come up around that crazy cream we put in there, but as soon
as I opened the hatch, the whole world came out.
SC Okay. Okay, it's closed.
SC Okay, 326 repress package off.
SC Standby.
SC Well, we got all the stuff in here.
SC Got it all.
SC Okay.
SC Repress package is off, huh? 60102
repress goes to open and reclosed. Cabin pressure 1 csi.
SC I can't see what the --
SC Geno, then you'll have to give us a hack
on 1 csi, if you can.
SC Wait a minute.
CAPCOM Gene, we'll watch and we'll give you a hack
at 1 csi, no problem.
SC Okay, repress is open. And, I can't get
if off (garble).
SC It's going to come pretty fast, Ron.
SC I can't even -- wait a minute -- I can't
turn around Ron.
CAPCOM And, America, we see your cabin coming
up. You're at 3/10ths.

SC Three tenths?? (Laughter).
CAPCOM You're at seven tenths, seven tenths.
CAPCOM Okay, (garble) you're reading 1 csi.
SC Okay.
SC Okay, give us the GO when it looks good,
Houston.
SC Oh, yeah. See the hatch --
CAPCOM America, you're looking good. No (garble).
SC Okay, we're going to go --
SC Okay, repress open and let it go to zero,
Ron.
SC We'll end up with about 2 feet of (garble).
SC Can you see the gate?
SC Well, wait a minute.
SC (Garble) Uh, there we go. Okay, I can
see - no that's temperature. Okay, here it is.
SC No, no. I mean the repress 02.
SC (garble)
SC (garble)
SC It's almost zero. Oh, you wanted the
cabin pressure.
SC Now, repress 02.
SC It's about zero.
SC When you think of zero, you think --
CAPCOM Okay, Gene, we got (garble) - we're indicating
about 2 csi down here at this time.
SC Okay, Ron. If it's zero, you can close
repress 02 valve.
SC Okay, we'll close the repress 02. What
the -- Uh. Okay (garble).
SC We're going to let your (garble) rate.
SC Okay.
SC And you next move after we get a hack at
3 will be to disconnect your OPS hose and hold the correct
(garble) on the cabin volume, and we'll get your OPS on.
SC Would you -- would you believe I'll let
you do that?
SC Yes, I would.
SC Okay. Because you'll be (garble).
SC Yeah. Yeah, I'm almost down there now.
SC Say, Houston, I was surprised when I
closed the hatch here. It came closed real well, up until
about an inch from the (garble).
SC Can you see the (garble)?
SC No.
CAPCOM Ron, we'll (garble). I'll give you a
call at 3.

SC Oh, okay, mighty fine, Bob. I was going to say the -- when you're closing the hatch, I expected it to come all the way closed, you know? And, it came to within an inch of the -- of being closed on the outer -- not the inside, but the other side, and wouldn't come any more, unless you really pulled on it.

SC Yeah.

SC So, and then (garble). You pull it closed, and then once you get the lever over the -- over the center, it comes right closed.

SC Okay, Ron, what I'll do when we get up to 3, I'll disconnect your OPS hose, Jack, and I'll let you pull it around behind his back. And, then, you can hold it in the open cabin and I'll actuate his OPS.

SC Well, we got a lot of use out of OPS.

SC Yeah. Let me actuate it, okay?

SC Okay. I'm glad I didn't have to earlier in the week.

SC Well, me, too, you know. I'm glad I didn't have to today either.

SC Yeah, I am, too.

SC You know, my gloves are dirty, but I think they're dirty from getting ahold of that -- those dirty suits of you guys, you know. Jack, did you get (garble)?

SC Okay.

SC You know how you all -- you want to see if there's any residuals from the thrusters out there, you know. Well, I couldn't see anything anywhere except the -- on the EVA handrails themselves. And, that really didn't look like it was a residual to me. It's just a discoloration and it's kind of a changing of the condition of the -- whatever is on those things, you know. Hope they're not painted.

SC Here's what I'm saying is that they were shiny burnished aluminum, I guess, or whatever, prior to liftoff, but now they're kind of a dirty-looking burnished stuff.

SC (Garble)

SC Okay, Ron, when I give it that 3, I'll get your hose, Jack can hold it in the cabin, you can activate your own OPS.

SC Okay.

SC Then, we'll watch the cabin come up to 5, and then the OPS will come off, (garble) 102.

SC It was a try.

SC How we doing down there, Houston? This is America.

CAPCOM America, you're looking great. You're up at 2.6. It's going up slowly, just like we expected.

APOLLO 17 MISSION COMMENTARY 12/17/72 CST 15:21 GET 258:28 MC959/4

SC Okay.
SC Not a bad performance by my CMP, was it?
SC (Laughter)
CAPCOM Ah, was beautiful. We had a beautiful
television show. Really beautiful.
SC Well, we got your (garble).
CAPCOM Yes, indeed, you made a lot of people
in the back room very happy. They're looking forward to
getting that film.

END OF TAPE

SC Well, the best part about it is from all indications it ought to be real good film too.

CAPCOM Yes, sir. Looks like everything worked out great. Your at 2.7 and climbing very slowly.

SC (laughter)

SC Hey, Houston. Tell Chuck Stahl that attitude for the EVA was outstanding.

CAPCOM Thank you, Ron, he's listening right here and he's been on the console during the whole period. Got a big grin on his face right now.

CAPCOM And America, the cabin is at 3 psi.

SC Okay, Robert, we're pressing on.

SC Can you get 'em off?

SC Hey, Jack, can you get the - hose from behind him.

SC Okay, go ahead and activate it young man.

SC You got all of it, Jack?

SC Okay.

SC Yeah, hold on to it tight.

SC Go ahead.

SC Yeah, it's really blowing in there.

SC Okay, we'd like a hack on the cabin when we get to 5.

CAPCOM Roger. America we'll give you that.

SC (garbled)

SC There has?

SC Yep

SC Let's check main regs (garbled)

SC Must be the main regs cutting in.

SC (laughter) you can't do that to a (garbled) Can you?

CAPCOM Okay, America, you got 5.1 cabin pres.

SC Okay. I'm coming up.

SC Okay.

SC Okay. I got to pop the camera out there then I'll turn mine off pretty quick.

SC Okay.

SC (garbled) Oh, all right, it did come up that time. There's not that big a hurry.

SC We're waiting a long time to get - to get from 2 to 3.

SC Yeah, you get a high 02 (garbled)

SC Yeah, my - oh your assessorary bag's (garbled)

SC (garbled)

SC We'll probably get the tone down here.

APOLLO 17 MISSION COMMENTARY 12/17/72 15:31 CST 258:38 GET 960/2

SC Ding, Ding, Ding.
SC Okay, I got it.
SC Right. We did, didn't we?
SC Yeah, if we can't find that one, we'll
find another one. They're going to have something to stick
stick my gloves in.
SC Yeah. The thing you put your gloves in.
There it is right there.
SC Yeah, you gotta use yours. (laughter)
PAO This is Apollo Control at 258:46 ground
elapsed time. To run trans

END OF TAPE

PAO - - 46 ground elapsed time to run briefly over the transearth EVA event times. Depressurization began at ground elapsed time of 257:35. TV turned on shortly after Evans came out. Evans was clear outside the spacecraft at 257:45 approximately 10 minutes after hatch open - or depressurization I should say. He brought back the lunar sounder film cassette at 257:54. His mean heartrate during this early period of the EVA was running around 139 and 140, and began to taper off as he got more custom to this new environment outside the spacecraft. The panoramic camera cassette was retrieved at approximately 258:03 back into the cabin. Mapping camera cassette 258:16. Evans returned to the command module at approximately 258:28 the hatch was closed the TV turned off just about 4 minutes prior to the hatch closure. Repressurization began at 258:28 at hatch closure and ended just a few moments ago at 258:44. At this time there is an orbital science briefing which will begin in the main auditorium. The air to ground circuit will be recorded for delayed playback at the conclusion of the lunar orbital science briefing and a followup of that will be the change of shift press conference with the flight director Neil Hutchinson. Now estimated to take place at about 4:30. At 258:48 this is Apollo control.

END OF TAPE

PAO This is Apollo Control at 260 hours 22 minutes. During the time that we've had the air-to-ground lines down for the press briefings, there have been no major events in the mission. Things are continuing to progress smoothly and relatively quietly. At the present time, the crew is in the midst of an eat period, and we have about 18 minutes of accumulated taped conversation, which we'll play back for you at this time.

SC (Garble)

CAPCOM America, Houston. Your cabin pressure's up to 5.5, 55.

SC Okay, we'll turn (garble).

SC Okay, we're right now at the point where we're going EVA Station 020.

SC Take off my clothes? Por favor.

SC You got 'em on?

SC Yep.

SC Okay.

SC Supposed to stick them in the bag, aren't we?

SC Okay.

SC Smells kind of funny in there. What'd you guys do?

SC First time. Ohhhh, yeah, it's about 700 now, 725. Is that what that -- yeah, that's why -- that where we are? Okay, I'll turn the TV switch on. Well, we don't have to try to make that.

SC Okay?

SC Yeah, we can go to film. We got 600 700 (garble).

SC (Garble) repress at this time.

SC No, we take that down to 400, probably stop before that anyhow.

SC Okay.

CAPCOM America, Houston.

SC America here. Go ahead Bob.

CAPCOM Roger, Ron. Just two reminders here while you go through your unsuiting and cleanup procedures. We're trying to get established on a new biomed cycle, so we'd like to have the LMP on biomed. We'll be coming up with a complete scheduling here shortly, and this reminder for the LMP and the commander -- we want to make sure we receive their PRD's.

SC Okay, that's a good point. (Laughter)

SC Okay, on the air I gave you a PRD about 2 hours ago, and, just to bring you up to date to where it was, and we'll keep them out. The commander retrieved his yesterday.

CAPCOM Yeah. No problem. We just want to make reminder. We just want you to be reminded that we need them.

SC Take mine out now.
SC Wonder if I got any zapp's while I was
out there.
SC Thank you, Bob. I even forgot that I reminded
you to remind me.
SC (Laughter) And, 15055.
SC I didn't get very many rads while I
was out there, I guess. Seems like it was 51 this morning.
Okay? Here, hold this thing. How about giving me a squirt?
(Laughter) That right there. Yeah, three of them. I threw
away all the dirty ones, I think. The whole pack? Boy, it--
Yeah, it sure whipped out through there when I opened the
hatch.
CAPCOM Wonder what you'd seen the scissors go?
SC (Laughter) How about that? Hey, I'll
almost make a bet with somebody that it's still behind the
optics. Okay They don't look dirty to me, do they? (Garble)
SC You don't have enough push back there,
do you? Should have used hot water. Or is that thing cold
to me? Is that cold? Is it? Boy, that is cold, isn't it?
No, don't fool with that, just put the whole thing in there
like that. Uh, no.
SC Yeah, now you must have used some of that
good food tape that's stuck over there. And, there's some on
the side of the -- the light. We can use those to tape those
holes with electric sticky back. Yeah, just about. Yeah.
Yeah, that's all. Well, just about. Oh, yeah? There's a
chunk. Here's a hole through there. Oh, yeah. We got a
lot of tape, I'm sure. We want to tape this whole thing here.
SC Okay, Bob, we're in the process of
(garble).
SC Cleaning the computer holes (garble).
CAPCOM Say again, CDR, you were cut off on VOX
there.
SC Okay, I forgot Ron was still on VOX.
(Garble) I just wanted to keep you up to date. We're -- we're
taping up the cassettes and cleaning them up and getting them
stowed.
CAPCOM Roger, good show.
SC I'm sorry. I led myself astray. I see
it. Yeah, overlap it because it won't stick to that thing
very good. No, it just won't stick (garble). We'll just
take tape and wrap all the way around the thing. Oops.
Otherwise, it's not going to stick period. Good, good. Yeah.
It's up? That's right. (Garble) Oh, we've been doing this
for two or three flights, you know. Why change it for the
last one? Yeah, probably one all the way around. Get your cord
out of there. You know, we ought to have a roll of that

tape you guys brought. It's about that size, I guess. You got it? Yeah, they're down here. We missed them. (Laughter) Yeah. Keeps the - the light and the water out of it, I guess. You know the water can go through the breather holes. Turn them around this way. Does take a lot of tape, doesn't it. Yeah, sure doesn't stick to a cassette. Sometime. I couldn't find mine. They must have been in the other pair of gloves. Actually, I forgot about them. Well, that's (garble). No, there's nothing taped.

SC Okay, Bob, on 3-20. And, we're all going to get out of our suits and stow them before we get the center couch back in.

CAPCOM Roger, Gene. Sounds good.

SC And, I guess I can get some nav changes for you, if you'd like. (Garble)

END OF TAPE

SC Standby there.
CAPCOM Okay, Gene, you can go ahead and do the
dap change.
CAPCOM America, Houston, just one up date. We
won't give it to you as an up date at this time but wherever
you see IR work just ignore it. Do not turn the IR on and
no need to open the IR cover. We're through with it if
you'll just fire at entry interface.
SC Okay, Bob, understand that.
SC UV is ON. And the UV cover, coming
open.
SC Okay, Bob, I want to go through the
flight plan down through about 259:45 and get this maneuver
started. Then we can press on.
SC Hello Houston, America.
CAPCOM Go America, Houston.
SC Okay. I'm pressing on through the flight
plan to about 259:45 and getting everything up to and including
the maneuver and then we will continue with our post EVA.
CAPCOM Okay, we'd like for you to hold on that
maneuver, Gene. Don't start the maneuver.
SC I've already started my roll. Do you want
me to stop it?
SC Did you copy the IR was on and the cover
open?
CAPCOM Okay, we copy that. IR on and the cover
open.
SC I'm sorry. I was UV ON, UV cover OPEN.
SC Houston, are you reading America?
CAPCOM That's affirmative, America, Houston.
SC Okay. Did you get the word that it was the
UV ON and the UV cover OPEN.
CAPCOM Roger, we got the word.
SC Okay, and I'll stop my roll
at 270 degrees and will not maneuver till I hear from you.
SC Roger.
SC You're not getting a good key down there
by the way.
CAPCOM Say again, Gene.
SC Houston, your keying is cutting you out
I think.
CAPCOM Okay, are you reading me now?
SC Yeah, that was good. Did you understand
Gene's transmission on his stopping the roll.
CAPCOM That's affirmative.
SC Houston. Cabin fan's coming ON.
CAPCOM Roger.
CAPCOM America, Houston, you're cleared to go to
the VERB 49 maneuver as published in the flight plan.

SC Okay, Bob.
SC Houston, do you like OMNI Alpha now?
CAPCOM Negative. We'd like you to go to OMNI Charlie for now.
SC Oh, I'm sorry. Okay, OMNI Charlie, right.
SC No need apologizing. The flight plan says Alpha, we're just going to Charlie which is the best antenna.
SC Well, that's all right, I misunderstood what Gene just told me about his maneuver.
CAPCOM America, we'd like OMNI Alpha.
SC Say, again. You're cutting out badly.
CAPCOM We would like OMNI Alpha. OMNI Alpha.
SC Okay. You said OMNI alpha. Will (garbled)
CAPCOM America, Houston. Your com is going to be a little ratty until you get into configuration or rather get into attitude.
SC Okay, Bob, I'm reading you now. Say again please.
CAPCOM I just said it's going to be a little bad com until you get into attitude so we should hold this for a while.
SC Okay. Then when we get there you want OMNI Alpha. Right?
CAPCOM That's affirmative.
SC Okay, we'll give a key when we get there.
CAPCOM America, Houston. If you have somebody handy to the panel, we'd like to take the H2 tank 2 fans to OFF.
SC Roger, H2 Tank 2 fans OFF.
CAPCOM Thank you Gene.
SC We're OMNI Delta. We're reading you loud and clear. Do you want us to stay here?
CAPCOM That's affirmed, Gene. That's good. It's right on the line there. It Delta shows better on the signal strength and Alpha shows better on location. So we'll stick with Delta.
SC Okay.
CAPCOM America, Houston. Please advise us of how you are going to handle the waste stowage vent. Is that open or you going to close it now?
SC It's open right now. But we're going to close it here shortly. Do you think we need it closed now?
CAPCOM Negative. It's your option. We just want to know what - in case we get an O2 high we might understand what it's from.
SC Oh, I see. Okay, we'll close it after a bit here.

CAPCOM America you might be interested in while you're doing all this hard work up there you might be interested in some of the Texas football teams have faired. Houston had a tuffy today. Cincinnati took them 61 to 17.

SC Houston. They took who? 61 to 17.

CAPCOM That's what they tell me. And the other on is those - the biggy up at Dallas right now. The Giants leading the Dallas Cowboys in the third period 21 to 3. 20 to 3, Al. Correct that 20 to 3.

SC Okay. 20 to 3. New York over Dallas, right?

CAPCOM That's what it looks like.

CAPCOM That's in the third quarter.

SC Okay.

CAPCOM And Ron, we're going to do a site hand-over here in about 12 minutes and we may loose some LOC here.

SC Okay. That's all right.

CAPCOM And how's the post EVA checklist coming here? Coming along.

SC Oh, it's coming along. (garble) off now.

CAPCOM All right.

CAPCOM Well, they always say it takes longer up there than in the - got all evening to do it. There's no hurry on it.

SC That's right.

SC Hey. Hope North America doesn't think I was bad mouthing their spacecraft down here, because you know - a little bit of blistered paint on it. That doesn't hurt anything. It's still a darn good spacecraft.

CAPCOM No, I don't think North America even - I think it was just great, but I don't know if I'd ever go to Bethpage if I were you.

SC (laughter)

CAPCOM Ron, that was such a great show, I don't think anybody would care. That was - just tremendous.

SC Okay, Bob.

SC Okay, Houston. (garbled)

SC Roger.

END OF TAPE

SC Houston, America the waste stowage vent valve is closed.

CAPCOM Roger America.

SC Hello Houston this is America. Looks like the repress package is up, surge tank is back up would you like us to turn the sill off and turn the O2 heaters off.

CAPCOM Geneo EECOM says affirmative to all that.

SC Okay, Gordo how you doing.

CAPCOM Pretty good I saw Rons stroll around the service module looks like he had a ball.

SC Yes, he did.

CAPCOM America Houston over.

SC Go ahead.

CAPCOM We have silled up the DSE so we'd like you to go ahead now and do the maneuver listed at 261. Give us the high gain so we can dump it, over.

SC Okay, maneuvers coming at you.

CAPCOM Okay, and for your information charge number five just went off it was a three pounder and it's jiggling the instruments on the surface there properly.

SC Very good. Any new word on the gravimeter Gordie?

CAPCOM I haven't got it yet, Jack. Let me check. Have you heard anything since you asked me the question last night?

SC Well, whenever it was no I haven't heard anything.

CAPCOM Okay, I'll try to get an update.

SC I was thinking of the lunar surface gravimeter not the traverse. They apparently don't want to talk to me about the traverse gravimeter.

CAPCOM Okay, we'll try for SO on both of them.

SC Okay, any other new stuff you might have heard or get a hold of that I might be interested in.

CAPCOM Okay. America Houston we need OMNI charlie please.

SC Houston.

CAPCOM America Houston OMNI charlie please.

SC Hello, Houston, how do you read?

CAPCOM Okay, loud and clear go ahead.

SC Okay, we apparently in our struggles up here inadvertently hit the waste water dump and it's back in relief now. That dump is terminated and we have 30 percent waste water.

CAPCOM Okay.

SC I'm not sure what we had when it started. I just noticed the streaming. I don't think it was on very long.

CAPCOM Roger.

PAO This is Apollo control at 260 hours 44 minutes. We're up live now that completes our tape playback. Apollo 17,153 321 nautical miles from Earth. And one of the comments you heard from capcom advising the crew that the fifth of the explosive charges left on the lunar surface at Taurus Littrow had gone off as programed. The detonation occurred almost precisely on time at 260 hours 24 minutes. This is a one and a half or rather a three pound explosive charge located one and a half kilometers east of the lunar rover. And, we appeared to get good seismic data here in the control center. At the present time the crew is still in the eat period, and we've had relatively little conservation from them. It also from the flight plan looks as if we'll have relatively quiet evening. Very few things scheduled between now and the time the crew is to begin their rest period at 267 hours or about 6 hours 15 minutes from now.

CAPCOM America Houston we need - we could use the high gain now NARROW and REACQ.

CAPCOM America Houston high gain's not going to work in NARROW now wait a while it's in a skin reflection area.

SC Yes, I'm having the same problem - I noticed the same problem. How's this leave it in wide?

CAPCOM That will be fine.

CAPCOM America Houston, we'd like you to go to REACQ now wait 30 seconds and then go to NARROW.

END OF TAPE

SC Hello Houston, we're turning the cabin fan off for a while.

CAPCOM Roger.

CAPCOM America Houston we'd like NARROW beamwidth.

SC Thanks for timing 30 seconds for me Gordie.

I think that was beyond me.

CAPCOM Your welcome.

SC Doesn't look like it going to make it does it.

CAPCOM No it sure doesn't stand by one and we'll give you an alternate plan.

SC I'm back in white.

CAPCOM Roger.

CAPCOM America Houston. We're going to have to have the high gain for the dump and also for a little additional work with the HF antennas and the sounder that we're going to read you here in a minute. So, in order to get it we'd like you to pitch up 20 degrees in your present attitude and when you get there then we ought to be able to reacquire and go NARROW.

SC Okay.

CAPCOM Once you get the antenna locked on in NARROW it will track back to this attitude and that's what we'd like you to do is come back down to this attitude once you get the antenna locked on.

SC Okay, Gordie we've got a good lock now.

CAPCOM Okay fine well then go right on back to the program pitch attitude there and it should hold.

SC In work.

CAPCOM America Houston, we'd like to have somebody go to panel 230 and I'll give you switches real time save you writing them all down to get a couple of things cranked up here over.

SC Okay, what do you want in 230?

CAPCOM Okay, basically what we're going to do is turn the IR on with the cover closed to keep it warm so you can do that IR on now. And then we're going to put out the HF antennas and listen to HF getting some data on that ground noise from the Earth. If you'll put HF antenna two to extend we'll give you a cue when to go off when it's all the way out. Over.

SC Okay, HF antenna two to extend on my mark. Mark it.

CAPCOM Roger.

CAPCOM Okay, we'd like HF antenna two to off, please.

SC Okay, HF antenna two is off. It maintained barber pole all the time there. It never went gray until we turned it off.

CAPCOM Okay, it probably isn't out yet. The reason we had you stop was because recorder that's watching it broke down down here we've got to get that back on line.

SC Okay.

CAPCOM While your waiting there I can go over the football scores for the weekend if you wish.

SC Just a minute let's see if we can get Ron on the headset.

CAPCOM Okay.

SC He's walking - he's walking around here thinking he doesn't have to do anything anymore after that EVA, but we'll get him back to work.

CAPCOM Rog.

SC Okay, Houston we're ready for those scores now.

CAPCOM Okay, just one second Ron. I think we've got another switch for you here.

SC Okay.

CAPCOM Okay, we'd like to take the sounder HF antenna number one switch to extend. We'll let the motor on two cool off. We do have the recorder fixed so we can watch one now.

SC Okay, number one is going to extend, 3, 2, 1 mark it barber pole.

CAPCOM Okay, I've got the whole list of scores here some of these were yesterday you probably heard of but I'll just go through them all. San Francisco beat Minnesota 20 to 17, Miami made it I guess 14 straight 16 to 0 over Baltimore. And Buffalo beat Washington 24 to 7 how about that? Cleveland beat the Jets 26 to 10, Kansas City beat Atlanta 17 to 14, Green Bay won over New Orelans 30 to 20, St. Louis beat Phildelphia a close one 24 to 23, Denver beat New England 45 to 21. Detroit beat Rams 34 to 17 and Oakland beat the Bears 28 to 21. And here's some sad news the Giants beat Dallas 23 to 3. And one final score Cincinnati 61 Houston 17.

END OF TAPE

CAPCOM Over.
 SC Over. Gordy.
 SC Gordo, we -
 SC Miami contact - by comment, all 3 of
 my teams lost today.
 SC No. 1 just went gray on the lunar center.
 CAPCOM Okay.
 SC I'll turn the switch to OFF, if you want.
 CAPCOM That's affirmative. OFF on one and then
 on two we'd like you to go to RETRACT for 10 seconds and
 then put her in extend and we'll watch it.
 SC Okay. Retract 1, 2, 3, 4, 5, 6, 7, 8,
 9, and about 10, I guess. Okay, number one to extend now.
 CAPCOM Okay.
 CAPCOM Okay. We'll take number 2 to OFF please.
 And we're going to let the motor cool down for 15 minutes
 so you'll have at least that long until the next time we
 bug you.
 SC It's okay. It's OFF now.
 CAPCOM America, Houston. We'd like to try
 antenna number 2 again.
 SC Okay.
 CAPCOM What we want is you to go to RETRACT for 10 sec-
 onds and then EXTEND.
 SC Okay, wait one.
 SC Okay. RETRACT. There's 10 seconds.
 Back to EXTEND.
 SC It's going to EXTEND now.
 CAPCOM Okay, and we're just wondering where you
 stood on the post EVA checklist - procedures?
 SC Well, only about 75 percent through.
 What we're doing is storing all this stuff down
 here and then we'll go back through and check things off.
 CAPCOM Okay. Fine.
 SC Gordy, did our little waste water burn
 there, hurt us or help us?
 CAPCOM I guess we haven't been able to determine
 yet.
 CAPCOM Okay. HFQ antenna OFF.
 SC Okay. It was off when you called.
 SC Hey, Gordy, (garbled)
 CAPCOM Doesn't seem to be making much progress
 there. Go ahead.
 SC I was just going to say we took time out
 here to grab something to eat cause it's been a long time
 between breakfast and lunch so a - no change. Doing inventory
 here and give you a page and let you know about where it is.
 CAPCOM Okay. We're not intimating there is any
 hurry. We're just a little curious.

CAPCOM Okay, a little more application on that antenna. The motor gets hot and it slows down and it stops making progress. But each time we make a little more progress to getting it out and we're almost all the way. We are going to give it another cool down period. We'll give you a call when we want to try it again.

SC Okay. Sounds good.

CAPCOM I do have a bunch of short flight plan updates, none of which is very close in the future. So any time someone has nothing to do, I'll be glad to read them up.

SC Okay. Let's eat for a little while, Gordy.

CAPCOM Fine.

SC Is it still plenty cold back there?

CAPCOM That's the sum of it. It was clear and were you talking about the Houston weather? Or the SIM bay weather? The SIM bay's getting cold also. It's cool, but it was sunny here today. It'll probably be a cold night since it's clear.

SC Okay. Thank you.

END OF TAPE

CAPCOM America, Houston. We're ready to give another stab on the HF antenna.

SC Okay. You want to go RETRACT first for 10 again?

CAPCOM That's right. 10 seconds RETRACT and EXTEND.

SC Okay. Going to RETRACT and OFF.

CAPCOM Roger.

CAPCOM Okay, Ron, it's getting out there inch by inch, but we've gotta back off and hit it again. Go to RETRACT for 10 seconds, and then back to EXTEND.

SC Oh, okay. I went to OFF there for a second, and I'll go to RETRACT now and then to EXTEND.

CAPCOM Okay.

SC Okay, going to EXTEND.

CAPCOM Roger.

CAPCOM Okay, Ron, go to OFF, and it'll be another 10-minute wait.

SC (Laughter) Okay, we're OFF.

PAO This is Apollo Control at 261 hours 43 minutes. The exercise that we've been going through with Ron Evans and the antennas aboard the CSM involve an attempt to extend the second of the two elements of the High-Frequency antenna used in the lunar sounder experiment. Each of these elements is about 34 feet 2 inches long. Both together comprising elements of a single antenna. And, one of the -- one of the elements is extended, and the second is balking at extending. Apparently, due to being cold, and the resistance of pushing the antenna out is heating the motor up. Therefore, we have to turn it on for a period of time until the antenna bogs down and the motor begins to heat, and then turn it off to let the motor cool down. In order to assist in getting it out, and you heard CAPCOM Gordon Fullerton advise the crew that it's going out inches at a time. We're backing off a little bit on it to relieve the tension, and then having the crew go forward, and with each of these steps gaining a few inches on getting the antenna extended. Apollo 17 at this time is 151 300 nautical miles from Earth and traveling at a speed of 3440 feet per second.

PAO This is Apollo Control at 261 hours 53 minutes. We've just had the sixth of the charges left on the lunar surface by the Apollo 17 crew detonate, and we're receiving the seismic data in the Control Center. This is the charge designated Number 2, which is a quarter of a pound of explosive, and it had been scheduled to detonate at 261 hours 59 minutes, or about 6 minutes from now. All of the charges we've seen so far have been detonating within about 5 minutes of the nominal or T-zero time.

APOLLO 17 MISSION COMMENTARY 12/17/72 CST 18:27 GET 261:34 MC967/2

PAO These charges are part of the seismic profiling experiment and provide scientists with information about the subsurface structure in the landing site area.

PAO This is Apollo Control. There's one more of the seismic charges to be detonated, charge Number 3, which will be the eighth and final charge, and it's scheduled to be exploded on command from the ground at about 264 hours 10 minutes, roughly 2 hours 10 minutes from now. This charge is the closest of the eight to the roving vehicle located about 65 meters away.

SC Hello, Houston. America. Are you ready to maneuver here to the UV stellar target attitude?

CAPCOM Stand by, I'll check.

END OF TAPE

CAPCOM Stand by I'll check. Okay, I guess everybody is in agreement. Go ahead and high gain should stay on during this maneuver.

SC Okay, we're maneuvering. Hope the Sun comes in the window on this next maneuver.

CAPCOM Is it getting cool up there?

SC Well I'm freezing something off.

CAPCOM Hey we got a little procedure to warm things up in the cockpit if you'd like it.

SC We heard that earlier and we'll pass on that right now.

CAPCOM Was it the one about turning on inverter 3?

SC No, we didn't hear that one why don't you tell us what that one is.

CAPCOM Okay try putting inverter 3 on main A that will put some heat load into the system and then go to manual on the temp in valve. Go down and adjust the vap out temperature to 59 degrees - make it 55 degrees, 55 degrees. And that should help warm things up.

SC Okay, we'll let you know if we give that a try and Gordie I guess we're ready to copy some of those flight plan updates.

CAPCOM Okay, fine. We'll keep an eye on the temp out so that let you know if it's getting away. Let's see - let's start on - stand by one - start on page 375 at 263 hours.

SC Okay.

CAPCOM Okay, down at 263:40 where it lists the jets to use for spinup or for damping rather. We're going to change the jets to be used for damping since those ones listed didn't work so hot last night. Want to use all of quad delta, delta 1, 2, 3 and 4 and charlie 3 and 4 those 6 jets in place of the ones listed.

SC Okay.

CAPCOM Okay, and just to the left of that box delete IR cover closed and IR off.

SC Okay.

CAPCOM I guess delete the deletion I just got a call simply turn the IR on. We want to turn it off at this time so leave the IR off call as is.

SC You want to delete cover closed, but leave IR off as is, huh?

CAPCOM Yes, the cover is closed and we want to turn the IR off at that time.

SC Okay.

CAPCOM Okay, turn over two pages to 265:20 and make the same jet changes for the PGC rate damping all of quad delta and charlie 3 and 4.

SC Okay.

CAPCOM Okay, then turn over 1, 2, 3, 4 several pages - let me find the next one here. It's on 275:10.

SC Okay.

CAPCOM At 275:10 add charge bat A.

SC Yes sir.

CAPCOM Turn the page at 276:25 delete IR on. Then down a few lines at 276:45 delete IR cover open before dump and a few more lines at 276:57 delete charge battery A.

SC We got them.

CAPCOM Okay, turn over 2 pages to 279:05 and change LMP Don Biomed Harness to CDR Don Biomed Harness. 279:30 change - check CDR to - check LMP, change that to check CDR and then make it LMP Doff Biomed Harness.

SC Okay, I got those, but that's sort of slighting the CMP.

CAPCOM Okay, we'll consider that. Go on to -

SC (garble) and harnessing the Commander.

CAPCOM (Laughter) Rog. Okay, let's go to 285:10.

SC Okay.

CAPCOM Okay, right after VERB 48 add 3 steps, number 1 is radar off, number 2 is HF antenna to retract parentheses off on stadin Q. And the next step is the same for antenna 1, HF antenna 1, retract off on stadin Q.

SC Okay, radar off, HF antenna number 2 retract off on stadin Q and the same for number 1.

CAPCOM Righto and then same page 285:30, IR cover closed, delete it.

SC Okay.

CAPCOM Next page, 286:25, IR cover open, delete that. And on the next page, 287:13, IR cover closed and IR - Off, delete both of those. And a little further down the page it says LMP Doff Biomed Harness, change that to CDR Doff Biomed Harness.

SC Okay, I got those.

CAPCOM Okay, next page is another PTC rpinup same change, Delta 1, 2, 3, and 4 and Charlie 3 and 4 instead of the list of jets.

SC Okay.

CAPCOM Okay and then back tracking for one last one that was just handed to me, go back to 263:53 and the high gain antenna angles, change them from a minus 40 and 90 to 20 and 180.

SC Understand plus 20 and 180.

CAPCOM That's affirmative, and that completes the list.

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SC What about 285:30 on the jets?

CAPCOM I asked the same question, I think.
Let me turn to it here. Yeah, that one is a - just a
short, a short run on it and they'd just as soon it
wobble a little so they can leave those jets the same.
That's for a UV scan.

SC Okay.

END OF TAPE

CAPCOM Okay, guys, it's time for another try on the HF antenna.
SC Go ahead.
CAPCOM Okay. HF antenna to RETRACT for 5 seconds, and then EXTEND, please.
SC Okay, for 5 seconds. Going to EXTEND, mark.
CAPCOM Hey, good work. It finally made it out. Put it OFF, please.
SC It's OFF.
CAPCOM Okay, and then got some more steps here, as soon as I find them. Okay, lunar sounder operate switch to STANDBY. That's a verify, then recorder ON.
SC Okay. Operate is verified in STANDBY, and Recorder is ON, mark.
CAPCOM Okay, and radar switch ON.
SC Radar's ON.
CAPCOM Okay, recorder OFF and mode HF.
SC Recorder's OFF, and the mode's verified in HF.
CAPCOM Okay, that does it. We'll let her tick away now for awhile. Thank you.
SC I don't believe it. Got a tissue?
(Laughter) Exactly what I was trying not to do.
SC Houston, 17.
CAPCOM 17, Houston. This is Flight. Gordo's in the back with his family. Go ahead.
SC Okay, I just wanted to pass on an OPS pressure we owe you. That's 2000 psi.
CAPCOM Okay, copy.

END OF TAPE

PAO This is Apollo Control at 262 hours 54 minutes. At the present time we are replaying the video tape of today's CSM EVA. Apollo 17 at the present time is 148 900 nautical miles from Earth. This is a quiet period in the flight plan for the crew and we have scheduled an exercise period. And following that the crew will be setting the spacecraft up in the passive thermal control mode, rotating about the longitudinal axis of the spacecraft at about 3 revolutions per hour. This is done during a translunar and transearth phases of the mission to maintain proper thermal equilibrium. While the crew is in the sleep period, the crew is scheduled to begin an 8 hour rest period at 267 hours or about 4 hours from now.

CAPCOM Hello, America. This is Houston. We're ready for that rev 49 maneuver as shown in the flight plan.

SC Okay. We'll get to it here in just a second.
Say, Gordy, this is Jack.

CAPCOM Go ahead, Jack.

SC It may be my imagination but I thought I had a major blink in the light from the spacecraft. Not just the flood lights but just generally. Did you have any glitch or anything on the traces?

CAPCOM We'll take a look. Stand by. Give us your best guess on how long ago it was.

SC About - now about 20 seconds, maybe 30.

CAPCOM Okay.

PAO That was Lunar Module Pilot, Jack Schmitt, reporting what he described as an apparent blinking of the spacecraft lights, apparently a momentary thing. Schmitt asked if the ground would take a good hard look at the vehicle to see if there had been any sort of a glitch, presumably electrical. Spacecraft Environmental and Electrical Systems Engineer, John Arron is looking at the data now in detail and so far has reported nothing amiss.

SC (garble)

CAPCOM And we're rechecking on the EPS data. First glance shows it solid but we're not sure if it might have been static during that time. We're taking another look here.

SC Gordy, don't make a big deal out of it. It may have been just my imagination or somebody hitting the flood light switch but we tried - I - Gene tried that again and didn't seem like what I saw. It was just a very quick blink in the light.

CAPCOM Okay, we'll still chase it down.

SC Okay.

PAO EECOM's John Arron reports that the data we have available in Houston at this time, shows nothing - no problems - nothing wrong with the spacecraft. We are going to double check the data by replaying tapes recorded at the receiving station at Madrid, Spain. And looking in great detail at all of the spacecraft's electrical systems to see if there was any sort of a glitch. So again at this point, nothing shows up as being amiss.

AMERICA Hey, Gordy, Jack.

CAPCOM Go ahead, Jack.

AMERICA I fail to understand why all my friends who used to operate in the back room, even though it's Sunday, why they haven't given you a sort of an interim report on what they think happened at Taurus-Littrow. They usually have those things available.

CAPCOM Well, I did - you mean the whole geological summary?

AMERICA Well, just the general thing that they pass around after a day or so, I think, in the time frame they work in.

CAPCOM Yeah, there has been such a thing I think you're referring to. I guess there's a more formal version to coming that's supposed to be due out tomorrow morning, but there was a summary, fairly lengthy, on entire science, including the field of geology, which I'll try to dig up and maybe read to you if you wish. Over.

AMERICA Well, I don't need a lot. I guess it might be useful to have a general summary maybe tomorrow morning sometime if we have some time in the flight plan of what people have seen up to date on things that we wouldn't normally be familiar with, for preparation for that press conference.

CAPCOM Okay, sounds like a good idea. On the - your gravimeter questions, the TGE numbers for the comparison I believe you wanted, between the north and the North Massif and the Sculptured Hills, just aren't available. The whole TGE team took their data and left town, evidently. And - We have been unable to come up with any good numbers on that question. The undersurface gravimeter - okay - break break here. We need a VERB 48 load as shown and then -

AMERICA It's already in, Gordy.

CAPCOM Okay. So, you can go ahead and do the maneuver then. On the LSG, still no positive success. They've sent just about all the commands they it take with no luck at levelling the beam and so they've decided to fall back and the whole team is regrouping to consider further course of action. They've turned off the command to ED until sometime tomorrow when they'll try again, evidently, with whatever they come up with in their conference. Over.

AMERICA Okay. We're certainly pulling for them, of course.

CAPCOM Roger.

AMERICA Gordy, I'm afraid that apparently it's a problem just in the levelling commands, or it is receiving other commands, is that correct?

CAPCOM That's the impression I have. I hate to say yes certainly. My impression is that it won't, won't level. It will accept commands but the beam will just not level for a

reason they just don't fully understand.

AMERICA Okay, did that mean that you might - maybe you could ask Bob when you see him or something - does that mean the beam is not free, or is it not level?

CAPCOM As I understand it - stand by one - Jack, I got quick agricultural explanation of the problem. Evidently, it's the two plates between which the beam itself is suspended, are adjustable so that - by ground command, so that by driving these plates back and forth, they try to center the beam between them and then the data is initiated when the beam vibrates between the plates it changes capacitance or at least that's the general principle. And the problem is that by driving, they can command the plates back and forth and stop the stop but they cannot get the beam to leave - leave one of the plates. It's hung up against one plate and this could be caused by one of the wires that's suspended, sort of hangs the beam pendulum fashion, being broken so that it has cockeyed off to one side. I guess that's the best guess as to the malfunction at the moment. It's presently in use as a seismometer returning data in that mode, but useless in it's primary intended data taking mode. Over.

AMERICA Like, did they see the beam leave the plates at all as I shook it there near the last of our third EVA?

CAPCOM I guess the answer to that is "no". They saw you jostling it around and could tell that you were from the data, but have no evidence that the beam ever moved from the one plate.

AMERICA Isn't there any possibility that the telemetry is giving them a false indication of not levelling? Or not centering, I guess would be a better word?

CAPCOM Stand by. No, Jack, evidently they've eliminated that possibility. They're certain it's a problem - a mechanical problem.

AMERICA Okay.

CAPCOM Jack, reference your - the blink you noticed, or possibly noticed - we, looking at the data see about 30 seconds prior to the time we think you mentioned that it happened, but that's close to the time frame, I guess, a one or two amp oscillation in the main B voltage or current, and it only lasted for one or two data cycles, or like a tenth or two-tenths of a second is all. We would like to know, though, approximately what setting all the flood lights are at right now.

AMERICA LEP are full bright and the left hand are about three quarters, right hand's about three quarters. Jack's the only one who saw that. We didn't - Ron and I didn't see anything on that one field trip. If it happened, it was awful quick.

CAPCOM Okay.

END OF TAPE

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CAPCOM America, we'd like H2 tank 1 fans ON,
please.
AMERICA They're on (garbled)
CAPCOM Okay.
AMERICA Go on a dampened mode with Delta 1, 2, 4,
and *garbled).
CAPCOM Roger, Gene.
CAPCOM Okay, America. We've got another change
to the changes. We'd like you to leave the IR on until our
cue here.
AMERICA Okay. I'll change my change to my change.
CAPCOM Rog. - America, Houston, the rates look
good we're ready to spin it up.
AMERICA Okay.

END OF TAPE

PAO This is Apollo Control at 264 hours 15 minutes. The ALSEP staff support room here in Mission Control reports that the last of eight seismic charges left on the lunar surface by the Apollo 17 crew has detonated and a charge went off at 264 hours 14 minutes or about 4 minutes later than the nominal time of 264 hours 10 minutes and within the normal range that we've seen for the other seven charges of about 5 minutes either side of the planned time. This charge was a 1/8 pound charge located about 65 meters from the Lunar Roving Vehicle, the charge that was closest to the landing site of Apollo 17. These charges are part of the Lunar Seismic Profiling Experiment - the seismic waves produced by the explosions provide information that scientists can use in interpreting the sub-surface structure in the area of the landing site.

SC Houston, 17.
CAPCOM Okay, go ahead.
SC Hey, I was just wondering how the high gain's working out for you.
CAPCOM Looking good, Jack.
SC Okay.
CAPCOM Jack, Houston, over.
SC Go ahead.
CAPCOM The high gain is holding on here but we think we can improve - the time we can hold on to - narrow beam waves a little bit if you tweak it to pitch plus 15 and yaw plus 185.

SC Gordy, you said plus 15?
CAPCOM Affirmative, plus 15 and a plus 185.
SC Okay.
SC Gordy, the cannister's changed.
CAPCOM Thank you.
SC I guess you're looking at the orange

light, too, huh?

CAPCOM That's affirmative.

PAO This is Apollo Control. The orange light that Jack Schmitt was referring to is a gimbal warning light - one of the caution warning system lights that, in this case, indicates the attitude of the spacecraft approaching gimbal lock. However, this is of no concern. The passive thermal control attitude that the spacecraft is in was expected to bring them close enough to that limit to trigger the light, but will not cause any problems. The spacecraft at this time is in the passive thermal control mode, rotating about its longitudinal axis at the rate of about 3 revolutions per hour to distribute the heating and cooling effects of sunlight on one side and the heatsink of space on the other and produce uniform heating and cooling within the spacecraft structure.

PAO This is Apollo Control at 264 hours 37 minutes. About an hour and a half ago Jack Schmitt reported what appeared to him as a transitory blink of the spacecraft lights. He asked if we'd seen anything in the telemetry that indicated any sort of a glitch or a problem in the spacecraft electrical system. At that time the EECOM looked at his telemetry displays and said everything appeared to be normal, but to be doubly sure, we had the data replayed from the receiving site at Madrid where it had been picked up from the

PAO (continued) spacecraft and looked at the data second by second. Aaron has completed that review, John Aaron, the EECOM, and reports that he saw nothing abnormal during the period of time in question. However, there were a couple of instances where the spacecraft current levels increased or spiked, as they say, about an amp or two, but this is an increase of 1 or 2 amps out of a total of 78 to 80 some amperes being drawn by the spacecraft at this time, and is not considered abnormal. Gene Cernan reported after Schmitt asked the question that neither he nor Command Module pilot Ron Evans had seen the blink in lights that Jack Schmitt reported. Schmitt also allowed as how it may have been a - a figment of his imagination. There is, as they say, no - no explanation for the apparent blink in lights. We see nothing here on the ground that indicates anything abnormal in the spacecraft. Crew also reported that the spacecraft cabin was a bit on the chilly side and we read to them a procedure to increase the cabin temperature. We don't have a direct reading of cabin temperature - we can deduce indirectly what that temperature would be from air inlet temperatures which generally read lower than the cabin temperature itself. The EECOM estimates that the temperature in the cabin has been running somewhere between 68 to 70 degrees - probably in the high sixties, and hopefully beginning to come up a bit now. At the present time Apollo 17 is 145 300 nautical miles from Earth, traveling at a speed of 3600 feet per second now. The crew is scheduled to begin a sleep period at about 267 hours. They've completed the exercise period. Ron Evans, who is on the bio-medical sensors, is exercising and the surgeon reported seeing the - seeing his heart rate rise, indicating that he was exercising.

END OF TAPE

PAO getting at his exercising.
PAO And at this time the surgeon reports Lunar Module Pilot, Jack Schmitt, is exercising as indicated by a rise in his heart rate.
SC Hey, Houston, America.
CAPCOM Go ahead, Captain.
SC Okay, Gordo, I took my Comm carrier apart, you know, cut this little cloth covering that goes from the plug on up to the headset and what have you, and sure enough, there's 2 little broken wires in there and the next one is a little bit - the next one to it is a little bit loose also. But I found a little piece of metal and I bent it to the - conform to the shape of the wire and I've got it taped up real tight right now and I'm going to see if it works for a while, make sure that it doesn't cut in or out you know or something like that.
CAPCOM Okay, good luck.
SC (laughter) Okay. Of course I still have the light - lightweight headset. I'd just as soon wear the comm carrier for the reentry, if possible.
CAPCOM Roger. Say, we've investigated a little more on that possible spike that a - or was alleged that Jack, thought he might have seen, and we mentioned, I think, in response to that about a one or two amp jump, we're looking further, we see those all along and we think they're probably due to a minimum impulse jet firings. We're trying to correlate that data, but the conclusion right now is that we really don't see any thing on the data to support what Jack might have seen.
SC Okay, mighty fine. We just wanted a view in case there was something there. Wanted to make sure you all took a look at it.
CAPCOM You bet.
SC Yeah. Knobby, okay Knobby, where are you. Hey, I can see a few stars out there on this side of the window. Can't see any thing there, that's right behind the - look out, there it is, though.
SC Houston, 17.
CAPCOM Go ahead.
SC CAPCOM, this is Jack, is any body watching my heart rate - heart rate over the last 15 minutes or so?
CAPCOM That's affirmative, we have.
SC What did I peak out at?
CAPCOM You peaked at 105, Jack.
SC Eumm, okay.
SC Well, what do you know, you got to be quick, just disappeared behind the (garble) limits.

SC No, (garble) go ahead. Gosh, Jack's going to stir the cyros again, not stir them but de-stratify them. 36 vega, ahhh Vega is nothing but a pair. That really shakes the spacecraft, Jack, you can see it when you sit there marking on a star and it just shakes it back and forth. That's all right, no problem. No, no, that's what I say, no problem. No angle difference point 1 the elliptic there. Number 1 and 36, and then? Okay, Houston, and we'll talk at - if you're all set in here.

CAPCOM Yeah, we're all set.

SC Okay. How about 58 45.

CAPCOM Okay, and then when you do that we want you to stop the PTC right now, and we want you to use the jet configuration - configuration we used to start it up, that's all of quad Delta and Charlie 3 and 4 rather than the Jets listed in the flight plan. Over.

SC Okay

CAPCOM And, while we are mentioning Jet configurations, that Jet configuration is, this is another change to a change to a change, and we're sorry about this, but we want you to use those Jets all of Delta and Charlie 3 and 4 for every stop and start of PTC from here on out all the way through the final PTC exit just prior to mid course 7, which is shown in the flight plan and the way we want it, using combo jets for that final one. But use Delta 1 through 4 and Charlie 3 and 4 from here on out for going in and out of PTC and I can read you all the time so that applies to so if you can just remember it you can save some writing. Your choice. Over.

SC I'm down here in the spacecraft so I'll buy.

END OF TAPE

AMERICA It's probably right down here in the spacecraft somewhere. (garble) okay. Gordy, you want Dodo one, two, three and four, and Charlie three and four for damping, and you want Bravo two and Delta two for spinup as the flight plan says.

CAPCOM That's affirmative, and the damping is for both entry and exit of PTC, so from here on out except that final one which is coupled just prior to (garble) 47.

AMERICA Okay.

CAPCOM And, you don't need to wait 'til roll of 14. You can go ahead and stop it right now - we prefer it that way as a matter of fact. Over.

AMERICA Okay. Is that a CDU glitch here, Gordy? We sure did. Hello, Houston, can you read America?

CAPCOM Yeah. I was just trying to get an answer for you. Yeah, it looks at first glance like maybe we saw one. Stand by. I'll get you a better update.

AMERICA Gordy, why don't you give me the best OMNI?

CAPCOM OMNI Delta is the best rate at the moment.

AMERICA Well, we'll hang on to you here as we go - you were just on the verge of dropping out but we'll stay with you on the high gain. Yeah, Gordy, our ball, let's see, reads here about 256 roll and yaw - and pitch is 2 - or 227, and yaw is about 42 degrees.

CAPCOM Okay. Gene-o, evidently you definitely had a CDU glitch. We're trying to come up with an attitude that you can fly to on the ball as it stands right in SCS Stand by.

AMERICA Houston, both SCS and the IMU ball are okay, I think. They're both the same. Well, they're almost - except for the TDC - except for the GDC, drift, they're both the same. So the error is in the NOUN 20 computer.

CAPCOM Stand by. Ron, does the GDC and the IMU attitude agree right now?

AMERICA Yes, they do, they agree, give or take for the two or three degrees that the GDC drift is all.

CAPCOM Roger.

AMERICA And there's our NOUN 20 on the computer now.

CAPCOM Roger. America, Houston. What we'd like you to do is - were those ball angles you read 25604 - let's see - get the right order - 256227 and 042. Are those still about the - where you are?

AMERICA Yeah, that's affirmed.

CAPCOM Okay, we're going to try to compute an attitude that'll get us to high gain so we have a little more visibility under the system. That's our problem right now.

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AMERICA Okay.
CAPCOM America, Houston. What we'd like you to do is roll 180 degrees to about 076, roll attitude.
AMERICA Okay, we'll roll her back to 076.
CAPCOM Okay, then once you get there, the high gain angle should be pitch to minus 50 and yaw two zero five. Over.
AMERICA Minus 50 and two zero five. Okay. (garble)
Gordy.
CAPCOM Okeydoke.
AMERICA You might check. I was loaded NOUN 22 and you might just double check and see what you saw down there and make sure I wasn't loading on NOUN 20.
CAPCOM Okay, good call, we'll do that. Can you give us best OMNI as you roll around?
AMERICA Okay, we'll try. Okay, it's OMNI Delta now.
CAPCOM Roger, loud and clear.

END OF TAPE

SC Houston, I doubt if it's a problem, but the UV cover's still open.

CAPCOM Roger, Jack. Okay, we'd like for you to zero the CDU's now.

SC Look's about right. Looks good, Gordy, it matches the ball.

CAPCOM Roger, we see that. We're getting high bit rate now, by the way, also.

SC I don't know, you can track it down, but I called up NOUN 20 to check the roll angles and it was not what we were using in the book here, of 14 degrees, and I very easily could have loaded 20, instead of 22.

CAPCOM Okay, we'll check that out.

PAO This is Apollo Control at 265 hours 18 minutes. The CDU glitch that is being discussed, refers to a small piece of - refers to a small piece of erroneous information which appears to have gotten through the CDU. The CDU being the coupling data unit, which is a black box that receives information from various measuring devices on the spacecraft, and converts them to a form that is meaningful to the computer. The CDU or coupling data unit in question, is one that handles this transfer of information from a measuring device in this case the inertial measurement unit to the computer. The indications that we've gotten so far from the checks run and the telemetry data that we've looked at, do not show any problem. The essential thing is to understand what the nature of the erroneous information that was fed through this CDU to the computer might be. It's very conceivable that there will be a ready explanation for an erroneous bit of information getting through. If, in fact, there is some problem, and the CDU can be expected to continue feeding erroneous information to the computer, there is a program that can be loaded into the erasable memory of the computer which in effect allows it to question the information that's fed through and to in effect, make a determination as to whether that information is reasonable. If it's not reasonable, the computer then throws it out. And we now have high bit rate data from the spacecraft so we'll be able to look in great detail at this particular aspect of the guidance system.

CAPCOM Now ready to proceed on with the flight plan with the VERB 49 to the sleep UGC attitude. We have not had a chance to go back over the data but we'll give you a call as soon as we get a chance to check it. Over.

SC Okay, Gordy. One other interesting thing was we went back and looked at NOUN 22 after the glitch. We still had the NOUN 22 angles I had loaded for the previous VERB 49 at 263 40 which either even makes me feel more like I did not load 22 on this last time around.

CAPCOM Yeah, it sounds - it sounds like we might have the problem nailed down but we'll double check that.

SC This is a gross admission if that's the case, but I'd rather have it that way.

CAPCOM We won't hold it against you. America, Houston, why don't you hold the PRO on - on this VERB 49 until we have a chance to check and see if we're going to a gimble lock problem.

SC Okay. Gordy, can I use that roll we got 142? I'll stand by until you check that gimble lock out.

CAPCOM Stand by. We're checking that. Your answer is negative, Geno. The present roll - the maneuver should - it shows on our computer, you'll go through gimbal lock so we suggest you go to 14 and then back to maneuver. Over.

SC Okay.

CAPCOM America, Houston. Can you give us AUTO and NARROW on high gain? Present angles are okay.

SC Okay, Houston. The computer knows where the stars are in here.

CAPCOM Okay. We'd like AUTO and NARROW and make sure you've selected high gain also.

SC Wise guy. Works every time, doesn't it?

CAPCOM Rog.

END OF TAPE

CAPCOM Well, America, the final evidence is in and we're all putting our EFE books back on the shelf. We played it back and we see the VERB 21 NOUN 20 which is what did it and a - 22 -

AMERICA Okay, I've been sitting here thinking about it. Yeah, I had - and also the glitch occurred when I did the final (garble) or so, plus we had the two axis glitch in a number of things. I'm glad you found that. Makes me feel better. We were discussing whether or not you needed an EMP or not.

CAPCOM Well, there must be one for the situation.

AMERICA Getting a little quiet up here, anyway, Gordy. That one sure snapped us up.

CAPCOM Us, also.

AMERICA Hey, how far are we from home?

CAPCOM Well, I can give it to you in hours symmetry interface right away - 38 hours 42 minutes and 4 seconds. And in miles you're 143 500.

AMERICA Okay, thank you.

CAPCOM Picking up speed all the way. America, Houston, over.

AMERICA Go ahead, Gordy.

CAPCOM I've been talking to Don Batey and Dick Crews and looking over a transcript of a science press conference we edited up. It was kinda ragged but possibly interesting summary of the science as it stands now. In response to your question of items that might help you to prepare for tomorrow's press conference, I can come with you with those words any time you wish.

AMERICA You can come with them now.

CAPCOM Okay. Let's start with the LSPE. All eight charges have now been exploded and they were all on schedule and produced excellent signals. These data were used in conjunction with the ascent stage liftoff and also it's impact data which should give us an excellent picture of the geologic structure of the outer three kilometers of the Moon. This little summary I'm reading right now is - was written by Joe Watkins. The geophone array is functioning beautifully and we're already talking about it's potential for a listening mode for study of meteorite impact frequency. We still don't have precise EP locations on ray batson so the following interpretation will almost certainly be changed when we get better data and field tapes which we will use to refine our arrival time. Bearing the above in mind, my preliminary interpretation is as follows: the low velocity layer seems to be thicker than higher in velocity than at either Apollo 14 or 16 sites. I think this may mean that the low velocity layer here includes dark mantle material as well as the regolith. Details of the higher velocity substraight are fuzzy but velocities increase with depth in a way which will be consistent with a thick accumulation of lava flow. This probably represents the subfloor

material and he concludes by saying you guys did a great job. See you after splash. On the same subject, Dr. Kovac went a little further and he just recently admits to seeing evidence of two high velocity layers, especially after the 6 pound charge was fired - that evidence showed up. He also mentions in his press conference yesterday that the data point allowed by the ascent stage impact was very important - the fact that they got it in about 9 kilometers away - that data is right in a critical range where we see a big change in the percentage - velocity change - I'm getting kinda balled up here in the words, but that data is very important because it's in where the steep gradient and the velocity change occurs. On looking through here, I guess in summary - I'll read a couple of sentences again out of the press conference - we do find evidence of lunar crossed as we did in the past but we may have to thin it considerably. We may have in fact, have to thin it as much as 25 kilometers instead of 60 that they believed it was up to now. And they're thinking they may have to lower the velocity of seismic waves in the mantle which I guess, at last guess, was around 9 kilometers per second. Now, it's looking more like 7.5 and the crustal velocity is probably as slow as 6.3 kilometers per second. Okay, yeah, that was - that last data was released from Dr. Latham and he was interpreting that data mainly from the S-IVB impact and reading from some of the other seismic sites. Any questions on that? I realize that this is pretty ragged. Over.

AMERICA Oh, actually, it's great, Gordy. Did Kovac indicate his tentative depth for the second high velocity?

CAPCOM No, as far as the information we have here - it's just that - no, I don't see any - the only thing I can see is he mentions we're getting a depth sample down to 3 to 4 kilometers but that was before all the charges had gone off. So, I think, as I say, he just doesn't really state that yet.

AMERICA Yeah, it's a little early. Okay, good. Sounds like what we saw in the field to a certain extent.

CAPCOM Okay, on the heat low, it's continuing to work perfectly. It's stabilizing out and, at the present time, they show about a degree centigrade per meter radiant. Apollo 15 is stabilized at about 1.8 and it looks like the 17 site's headed for about the same which gives consistent data for the two sites. Looks like that's what is going to result when it reaches it's final equilibrium. And so that - if you call that - those two sites typical of the Moon, then that leads one to the following conclusions that that data requires that there be a total greater abundance of radiocative isotopes on the Moon as compared to the Earth, so there would be an implication here for a fundamental difference in composition between the two. And, the higher number of isotopes would, in turn, require that they be located very near the surface implying very substantial differentiation of the material, at least

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compositionally, or stratisfactionally. It's not necessary that it would have to be stratified. It was only required that it be stratified in most of - in that most of the isotopes be concentrated in the upper layers of the Moon.

END OF TAPE

CAPCOM I guess that's about what we've got on the heat flow at the present time. Over.

SC Gordie, does he indicate where his minimum temperature lays - known is now, at the site?

CAPCOM Stand by, let me look through here.

SC I think you mentioned something the other night - about - I thought you said 2 1/2 meters, but I'm not sure.

CAPCOM Let me just read it straight off here. There is some words to that effect but it doesn't sound like 2 1/2 meters. At a large scale - let's see, he's describing your view-graph here - the surface temperature at the time of this sample was 360 degrees Kelvin. At a depth of about 15 centimeters it had dropped to 280. At about 65 centimeters the temperatures drops to 254 and that's the lowest temperature we see. Below that depth the temperature begins to increase again and it's 257 at the bottom of the probes. Over.

SC Where was the 254 again?

CAPCOM At 65 centimeters below the surface.

SC Okay, that's about the same, I think, as 15. Very good. Some of our double cores will get that deep.

CAPCOM Rog. - Okay, the TGE has produced some - fair amount of excitement around here - and interest. The instrument really worked beautifully. It had some baro switches that turned it on for temperature control - right during liftoff - and so it had 3 days to stabilize before you got to Taurus-Littrow and on landing the bias measurement showed that the bias shift was extremely small so they feel that they had a very accurate reading on all the readings. And, I mentioned the other night that the number they got for the gravity field at the landing site should allow them to actually revise the value for the radius of the Moon at the landing site. But, then you asked me about some of the variations in reading around the valley there. Well, it turns out that - if you call the landing site zero on the scale of millegals and then take differences from the landing site over at the South Massif you have a minus 36 - in other words a lesser amount of gravity - and all these numbers, by the way, are corrected only for elevation and there are some more sophisticated corrections to - to be put on them. But the - with - correcting for elevation you have a 36 millegal negative anomaly at the South Massif - and the number at the North Massif was a minus 26 - and there is very little difference, within a millegal or so, between the North Massif and the sculptured hill site.

CAPCOM (continued) But, you can see that there's a significant difference between the landing site and the foothills on both sides. The Shorty crater showed a slight positive anomaly compared to the landing site but it's less than a millegal, which is sort of - you start to think "Well, that means a localized volcanic center" but it's - nobody's really going out that far on a limb. The - they were especially appreciative of the 2A stop which was - let's see - well, it verified the extremely sharp gradient of the anomalous condition from the foothills as you go back into the valley. The 2A stop - I'm trying to find the number here - Okay, one's a minus 36 at station 2 to a minus 29 at 2A so it's - it really changes quickly as you get away from the mountains. J.E. summarized his feelings by saying that a - a negative gravity anomaly which you measured right at the South Massif and the North Massif clearly indicate that the valley is filled with a higher density of material than the material which makes up the Massif. So, that if the material underlying the smaller Taurus-Littrow - say is phosaltic in composition and has a density of about 3, the material which makes up the Massif has a substantially lower density. He goes on to say that we're not sure exactly what the density difference is but if it's as large as 20 percent difference then the material in the floor of the valley and the - well, the thickness of the high density material in the valley has to be on the order of about 1 1/2 kilometers thick, so that's a - I guess that's a minimum thickness, assuming the radius difference in densities.

SC That's very interesting, Gordie.

CAPCOM Yeah, there really - everything is really tied in the original theories on the structure and make-up of the valley. Everything seems to be falling right in there and that's what has - has the whole crowd of scientists around here really smiling. A - let's see - let me find out what's next here. Okay, it was Strangway's turn next and he didn't have any results to present, of course, because he's got to get the tape back first, really. However, the Orbital Sounder - the metallogical sounder, when they made the pass across the site with the transmitter on - no, I got it backwards - when it was in a listening mode, listening to the ground transmitter's signal, they found that the signal was in exactly the frequency range that it was supposed to be and they picked up the - exactly the right sequence rate once every 8/10ths of a second. And when they calculated the power levels that we were putting out just exactly the one watt that we were expected to put out. So that - that everything looks good as far as the operation of the transmitter and without going into all the

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CAPCOM (continued) details which you know as well as I do about the thermal problems on the receiver, they're still - well as he sums it up we have no reason yet to be sweating it too badly. They're very hopeful that when the tape gets back we'll have good data on at least some of the LGS and they're - they're waiting for you to bring it to them. Dick Kruse is here and he mentioned that all your pains, Geno, on brushing dust off of it, probably saved the day. If it's there, it was just due to that that it did work because it was really on the ragged edge there.

END OF TAPE

CAPCOM That was the last I think is the field geology interpretation, and what I've got I can get tonight because there's no one really around here from the geology team at this time, it's about 11 o'clock at night, it's so rambling that I'm not going to bother to read it to you. But I will leave a request so that when Parker gets you up in the morning, maybe he can summarize that or answer any questions in that area that you might have. Over.

SC Okay, Gordy. Thank you very much.

CAPCOM No trouble at all.

SC Hey, Gordy, everything under control at the homefront?

CAPCOM Yeah, Ron. As a matter of fact, talked to Jan, and well her words to summarize the whole show that you put on this afternoon was "out of this world" which is I guess a pretty good way to put it. John and Jamie were speechless when you waved and called Hello to them. And Jan closed by saying that you - you're going to have to hurry home and help rebuild the wall that was broken out by a huge mob of people that were in your house this afternoon during the EVA. Over.

SC Well, that's okay. We like a lot of friends, and I'm glad everybody enjoyed it and pass my love on.

CAPCOM Okay, will do.

SC What about the other side of the tracks, Gordy? Any word from over there?

CAPCOM Hey, I haven't really talked to anyone in the other two families today so I'm sure that everything's fine or we would have heard it but I'll try to get a last minute update on that before you hit the sack.

SC Okay, thank you.

SC Gordy, this is Jack.

CAPCOM Go ahead, Jack.

SC Did you have a table there of the various gravity readings and if so what did we get at Van Serg? In your gravity to your window - to the landing site - landing point?

CAPCOM No, Jack. I don't have it. I'll ask but I think the ones I gave you the 4 places, Shorty, North, South and Sculptured Hills are all we got. I'll check.

SC Okay.

CAPCOM America, Houston. The rates look good now. You're clear to spin it up.

SC Okay. Gordy, I'm sorry I'm gonna move. Boy, this isn't my day. I'll give you the mapping again.

CAPCOM Okay, fine. 17, Houston. We're ready for spinup. 17, Houston. We're ready for spinup.

SC Gordy couldn't hack it any longer, huh?

CAPCOM He's getting some more news for you.

SC Okay, we'll check it right this time.

SC I think I got it for you this time. Houston, America. Are you ready for REACQ and NARROW on the high gain?

CAPCOM That's affirm.

SC Okay, you have it. REACQ and NARROW.

PAO This is Apollo Control at 266 hours 17 minutes.

The crew at the present time is establishing the spacecraft in its passive thermal control mode. This is rotating it about 3 revolutions per hour for thermal control which means that they're preparing to get some sleep. Sleep period is scheduled to begin at 267 hours and the PTC or passive thermal control mode is the normal set up for the spacecraft to maintain thermal equilibrium during a sleep period. The crew had reported a possible glitch as they referred to it with the CDU or coupling data unit about an hour ago at 265 hours 7 minutes. We looked in great detail at the telemetry data and replayed data from the time when this glitch occurred, and by looking at the data, have confirmed that there is no problem with the coupling data unit, and the guidance and navigation system which it forms a part of. To summarize the sequence of events, Gene Cernan was in the process of loading numbers into the spacecraft computer, telling it to maneuver to the proper attitude for passive thermal control, when he noticed that his eight-ball attitude indicator and his computer attitude readout disagreed. These 2 readouts if everything is as it should be, should be in very close agreement. Noting disagreement there, he advised that there was a possible glitch in the CDU or coupling data unit which feed information from the inertial measurement unit to the computer. The glitch being possibly that the CDU was feeding erroneous information to the computer. If this was in fact the case, the computer knowledge of the spacecraft attitude would become impaired. It would have been possible to work around this sort of problem if it were a transient problem. Now this would have been done by loading a program into the computer erasable memory which in effect would tell the computer to disregard inputs which were unlikely or unreasonable. As it turned out, Gene Cernan came up with the explanation for the glitch. He suggested that he may have loaded the incorrect numbers into the computer when he was asking the - or telling the computer to maneuver to a new attitude. Rather than telling the computer to maneuver to a new attitude by punching in the wrong numbers, he in effect told it - that's it's attitude numbers were incorrect and that it should load a new set of attitude numbers which the computer proceeded to do. And at the same time, the next time that he looked at and compared the eight-ball with the computer, he of course, found that they didn't agree. We were able to confirm that this in fact had happened by replaying data, looking at the numbers that were fed into the computer second by second and sure enough just as Cernan had suggested, a wrong series of numbers had been inadvertently loaded. The computer had done precisely what it was told to do and the indication of an error from the coupling data units was displayed.

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PAO Making a long story short, the coupling data units are functioning precisely as they should and there's no problem with the guidance and navigation system. Cernan, I'm sure a bit chagrined at a procedural error but as with everyone on the ground, relieved that a potentially significant problem turned out to be no problem at all.

END OF TAPE

CAPCOM America, Houston, we'd like to verify the present setting of the high gain knobs, we want minus 40 and a plus 90.

SC Gordie, that's verified.

CAPCOM Okay, thank you. I have a number of sort of clean-up items, before going to bed, that I can give you any time.

SC Why don't you go ahead.

CAPCOM Okay, we'll be calling you for the IR OFF before you go to sleep, want to leave it on right up to the last minute I guess. Let me see if we get could do this next one. Okay, why don't you just go ahead and do this one, H2 fans for sleep - number 1 OFF and 3 in AUTO.

SC Okay, we got that.

CAPCOM And there'll be no cyro stir necessary. You can leave the optics power switch ON which will increase the heat input and keep it a little bit warmer in there. You want have to turn that off for the presleep checklist, if you don't wish to. We are going to change the biomed -

SC Okay.

CAPCOM Tomorrow, in difference to the CDR's intimated request anyway, and let the CMP take the next shift where in the flight plan it now calls for the CDR. It was really our mistake on the original change. I guess there's no need to call all of those detailed flight plan changes now unless you want to copy them. A reminder also, prior to going to sleep, to bump the cabin up to 5 point 7 with the OPS to start getting the gas out of the OPS and I checked with the remaining 2 home fronts, Jack, your - I talked to your mother and sister. Every body's fine there and they watched the top of your head a little bit this afternoon on the EVA. They're looking forward to seeing you tomorrow on the press conference and back on Earth shortly thereafter. I got one from Nassau Bay, too, if the Commander's listening.

SC He's listening.

CAPCOM Okay, Gene, your Mother and family have arrived. They think they just walked in from a party, with Barbara. They all wish you to hurry home and send their love. Over

SC Houston, how do you read, 17?

CAPCOM Okay, 17, loud and clear now how me?

SC You're loud and clear.

CAPCOM Okay, did you get the home front update for the Commander?

SC Yeah, I got it, Gordie, and that's great news and news I wanted to hear, and return my love to them for me, if you would.

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CAPCOM Sure will. That completes our list
of duties with exception of the normal presleep stuff and
we'll be standing by for that, from you.

SC Okay, and you can tell the Arizona
people, next time you talk to them, I tried to get more
of myself out in that television picture but the
CMP saw to it that my umbilical was limited in its length.

CAPCOM Okay.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/17/72 GET 266:43 CST 2336 MC-981/1

PAO This is Apollo Control at 266 hours 47 minutes. Flight control teams are in the midst of a handover here in the Control Room. Flight director Chuck Lewis in the white team being relieved by flight director Pete Frank in the orange team. There will be no change of shift news conference. No change of shift news conference. The CAPCOM on this shift will be Bob Parker now relieving Gordon Fullerton.

CAPCOM America, Houston. I'll turn you over to the crew astrologer here. Pleasant dreams.

AMERICA Thank you, Gordy, and we enjoyed the day with you. See you tomorrow. Well, so much for that handover.

CAPCOM You guys call while we were unplugging?

AMERICA Haven't you learned better to unplug with an interval between?

END OF TAPE

SC Houston, we're going to turn the cabin fan off for awhile. Sorry, it's already off.

CAPCOM Okay, we copy, cabin fan is already off.

SC That's right. The fan's off and the request was to turn it on, so we will.

CAPCOM Okay, understand you're going to turn the cabin fan on. I think that's to keep it a little warmer in there for you guys.

SC Mark it, mark it.

CAPCOM America, Houston. We'd like to talk to Captain America, please.

SC Give him about - 5 or 10 minutes and he'll be with you.

CAPCOM Okay, have him give us a call when he gets ready.

SC Okay.

PAO This is Apollo Control at 267 hours 27 minutes. The crew has not yet turned in for the night and we'll continue to stand by, live, for any conversation. Apollo 17 now 139 456 nautical miles from Earth, velocity 3776 feet per second.

END OF TAPE

CAPCOM Apollo 17, Houston. We'd like to talk to you guys before you go to bed, please.

AMERICA Okay, Bob.

CAPCOM Okay, we panicked there, I guess, or we got our chains tweaked cause we saw you go voice off and we wanted to talk to you guys about two or three things before you went to bed. For one thing, we don't see the cabin pumped up yet with the OPS as per plan and we don't have the onboard readouts yet, and we'd like to find out who's going to be on the COMM and talk to Ron about his headset. I guess the general concensus of opinion down here, unless we know more about the fix, is there are some possible serious consequences like blowing up the audio panel if those wires did get together and short out, depending upon which wires they are. So, there's some concern about that.

AMERICA Okay, let's get you the read out first and we're going to box up the cabin here very shortly with the OPS.

CAPCOM Okay, we'd also like to get the Infrared to OFF, please - the IR.

AMERICA Okay, it's coming off here shortly. Okay, Bob, the RCS reads 65, 57, 61 and 60.

CAPCOM Okay, copy those.

AMERICA Houston, are you reading America?

CAPCOM I'm reading you now. The last thing we got from you was the RCS quantities. We didn't get the bat quantities.

AMERICA You haven't heard Ron at all?

CAPCOM Nope, haven't heard Ron a bit.

AMERICA Okay.

CAPCOM Sounds like the headset -

AMERICA Well, sure, I'm going to try again.

CAPCOM Okay. No, America, we're not reading Ron at all right now.

AMERICA Okay, he's been on the light weight headset talking to you all this time - why don't I just check those switches?

CAPCOM Okay. Which headset is broken? The Snoopy?

AMERICA Yeah, Ron's - Ron's Snoopy helmet.

CAPCOM Okay.

AMERICA Hey, are you reading me now, Houston?

CAPCOM Ah, I read you loud and clear now, Ron.

AMERICA Okay, I'm wearing the light weight headset now. On the comm carriers, there's a whole bunch of wires, about eight of them - looks like they're twisted pairs - twisted in fours really. They come up through the thing. And, two of those eight wires are cut - are broken in two. The hot end, or the end that comes up from the plug going toward the headset - those two wires both come out individually and individually taped, each one of them. And then the whole group - I

bent them out of the way so they wouldn't be touching anything, so they wouldn't touch insulation or tape. I bent them out of the way and taped the whole side of it just to keep the rest of them from breaking in two, and it looks like a pretty good fix on the thing, really. However, if you have any concern about blowing the audio panel up, I'll just go ahead and wear the light weight headset.

CAPCOM Okay, Ron. Yes, the concern here is not only which wires they are, but the potential does exist if one of those shorts to ground to blow the audio panel or at least the circuit breaker, depending upon which wire it is. I gather that what you've done - that you haven't wired the broken wires together, but it's just sort of covered the bare lead and wired them out of the way. Is that right?

AMERICA Yeah, that's correct. It was too close to the - there is a stiff piece of plastic that comes out of the headset itself out of the bottom of the left earset, and it's broken off too close to the bottom of it there to strip the wires down and wire them together at all.

CAPCOM Okay, roger on that. I guess - let us think about it overnight. Off hand, our opinion is, as long as you've got a spare headset, let's wear the spare headset - that spare meaning a light weight. If you're going to be on COMM tonight, I guess we off hand suggest wearing the light weight tonight. Over. How does that strike you?

AMERICA Okay. Yeah - no problem. I won't be on COMM tonight but I'll be wearing the light weight headset anyhow. The only time I was thinking about it - wearing the other one at all - would be for entry, and there's no problem there. I'll just stick to the light weight headset around my neck and put that one around my ears just to use as a bump pad, is all.

CAPCOM Okay, let us think about it overnight and we'll talk with some people about it. Let's see, is Jack going to be on the headset tonight and the biomed both?

AMERICA Yeah, Jack will be on tonight with the biomed and the headset.

CAPCOM Okay. We'd like to get one more valve check there, America. Like to check our waste water tank inlet valve to auto. EECOMM is in the flat portion and you can't verify that right now by it's buildup.

AMERICA Okay, stand by one.

END OF TAPE

SC (garble) fuse in AUTO, Bob.
CAPCOM Okay, thank you on that, Gene, and we did not get the BAT readout for the on board readout for the night, BAT C and power BATs A and B.
SC Okay, guess you read -
SC We're on 36 point 5, 36 point 9, 36 point 9 in that order.
CAPCOM Okay, we copy that. And let me ask you a question here, Gene, right now you're an hour behind getting to sleep, do you want to sleep the 8 hours or get up by the flight plan?
SC Oh, let's get up by the flight plan, we're very much aware of that, we've just been doing some restowage and a few other things around here, but let's get up per the flight plan, fine.
CAPCOM Okay, We'll talk to you in the morning as soon as the cabin is pumped up you'll go for sleep and you can turn voice back off at your convenience.
SC Okay, you'll see the cabin (garble) to 57 and turn the LPS back off.
CAPCOM Rog, we'll be watching.
SC Okay, Babe, take care.
CAPCOM See you in the morning.
PAO This is Apollo Control at 268 hours 9 minutes. We expect that will be our last conversation with the crew prior to the rest period. We'll leave the line up for a few more minutes and then take it down and come back up with hourly reports. Apollo 17 now 137 900 nautical miles from Earth. Velocity 3823 feet per second.
SC We're looking at 57 in the cabin.
CAPCOM So are we.
SC Okay. Bob, are you going to want to do that again tomorrow.
CAPCOM Yeha, Gene, I will do it again prior to finish emptying the OPS.
SC Okay.
PAO This is Apollo Control at 268 hours 19 minutes. The crew has turned off the voice downlink now indicating they are ready for bed and do not intend to talk to us any more this evening or this morning. We'll take the line down now and come back up with hourly reports. At 268 hours 19 minutes, this is Mission Control, Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/18/72 GET 269:22 CST 0215 MC 985/1

PAO This is Apollo Control. All spacecraft systems operating normally. The crew is asleep. 5 hours 37 minutes remaining in the rest period. Spacecraft America now 135 212 nautical miles from the Earth, traveling at a speed of 3904 feet per second. At 269 hours 22 minutes, this is Mission Control Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/18/72 03:15CST 270:22GET MC986/1

PAO This is Apollo Control. Apollo 17 now
132 949 nautical miles from Earth, velocity 3973 feet per
second. 4 hours 37 minutes remaining in the crew rest period.
At 270 hours 22 minutes, this is Mission Control, Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/18/72 GET 271:22 CST 0415 MC 987/1

PAO This is Apollo Control at 271 hours 22 minutes. All still going well with Apollo 17. 3 hours 37 minutes remaining in the crew rest period. Apollo 17 has passed the half way point in time on its return to the Earth. That coming at 270 hours 30 minutes 7 seconds. Half way point in distance will occur at 281 hours 32 minutes 45 seconds about 10 hours from now. At that time, Apollo 17 will be 104 396 nautical miles from both the Earth and the Moon. At this time the spacecraft America is 130 605 nautical miles from Earth traveling at a speed of 4047 feet per second. At 271 hours 23 minutes, this is Mission Control Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/18/72 GET 272:22 CST 0515 MC-988/1

PAO This is Apollo Control at 272 hours
22 minutes. Apollo 17 now 128 282 nautical miles from Earth
and velocity has increased to 4 120 feet per second. Crew
sleeping and began this rest period an hour later than the
planned time because of some entry stowage they were doing at the
time, and although going to bed later, they have requested to
be awakened at the regular flight plan time. 2 hours
37 minutes from now is wakeup. At 272 hours 22 minutes
this is Mission Control Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/18/72 07:15 CST 274:22 GET MC990/1

PAO This is Apollo Control at 274 hours 22 minutes. Apollo 17's velocity is continuing to build as it draws closer to Earth now at a distance of 123 440 nautical miles, speed 4279 feet per second. 37 minutes remaining in the crew's rest period. It's been a quiet night. All spacecraft systems continuing to perform very well. The space flight meteorology group with National Weather Service said a short time ago that weather conditions are expected to be satisfactory for the landing and recovery of Apollo 17 crew and spacecraft tomorrow. The weather forecast in the planned landing area, which is located approximately 360 nautical miles southeast of Pango Pango, calls for partly cloudy skies, widely scattered rain showers, variable winds of 10 miles per hour, seas of 3 feet and a temperature of near 80 degrees. At 274 hours 23 minutes, this is Mission Control Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/18/72 CST/7:51 GET 274:58 991/1

PAO This is Apollo Control at 274 hours 58 minutes. We're 2 minutes away from crew wakeup. Apollo 17 is 121 953 nautical miles from the Earth, velocity 4329 feet per second. Today's wakeup song will be in keeping with the crews theme that Apollo 17 is a beginning and not an end. We'll stand by now for the wakeup

(Music - "We've Only Just Begun")

CAPCOM Good morning, America. This is Houston.

SC Good heavens, it sounded like Bob Parker.

CAPCOM Roger, and in case you didn't recognize it, that was "We've Only Just Begun".

SC Or words to that effect.

CAPCOM And Jack, if you give us a call when all 3 of you get in the headsets, we've got something else to play for you this morning.

SC You have a call.

CAPCOM Say again.

SC I just gave you a call.

CAPCOM Okay, we'll cue up something else for you guys. And Ron, this was something that was recorded over at your house yesterday morning. I think you'll recognize it.

SC I'll have to wait and see.

(Music)

CAPCOM And America, if we could do some business this morning. At 275:10 we'll give you a hack on it - we need UD cover go to CLOSE, and we'll give you a call on that one. It's about 3 minutes.

SC Okay.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/18/72 GET 275:08 CST 0801 MC-992/1

CAPCOM Okay, 1 minute to cover close - UV, that is.
SC Hey, Houston, America. Sounds like people
are getting in the Christmas spirit around the Houston area there.
CAPCOM That's affirm. It's a little warmer this
morning but it still feels and looks a lot like Christmas down
here.
SC Well, Bob, it feels and looks a lot like
Christmas up here too.
SC As a matter of fact, the LEB reported a
temperature of about a minus 2 last night. (Laughter).
CAPCOM Okay, and 15 seconds to UV cover close.
Five seconds, mark UV cover close.
SC It's closed.
CAPCOM Copy that.
SC And the LEB was cloudy, cold, and snowing
last night.
CAPCOM Snowing too, hey? We're showing you a 61 degrees
in the cabin this morning, with a suit temperature of 48 degrees.
SC Glad I'm not in those suits.
CAPCOM You should've crawled inside the L-shaped bag, I guess.
CAPCOM Okay, and America, we'd also like to get
batt A to charge.
SC That's in work right now, Bob. Thanks for
the call.
CAPCOM You're welcome for the answer.
SC Well, we're trying to keep your spirits up
today.
SC Hey, Bob, what's 4 degrees equal in distance
from the Earth?
CAPCOM This is the new CAPCOM one, say again the
question? Four degrees equal distance from the Earth?
SC Yes sir, what is 4 degrees equal in miles
from the Earth?
CAPCOM RETRO says that 4 degrees essential angle
equals 94 K. You guys are out at about 125 K right now.
SC Okay, Bob, I was looking at the flight plan
and it said field of view is 4 degrees.
CAPCOM And we're going to have a network handover,
we may be momentarily - momentary dropout.
SC Okay.

END OF TAPE

SC Houston, 17.
CAPCOM 17, did you call?
SC That's affirm. I've got some reports for
you, if you're ready to copy.
CAPCOM Okay, we're all set.
SC Okay. CDR Menu, I'll try negative reporting.
He did not eat 3 apricot sugar cubes, pears and at lunch he did
not eat, half of the cereal bar. And at dinner he did not eat
tomato soup, half a hamburger, and the date fruit cake. On lunch
he had also, positive now, lemonade, 2 pecans, and 1/4 of a
chocolate bar. Okay, and last night, he had about 5 hours of
fair sleep, no medication and 2-1/2 cans of water and his PRD
is 17060, that's right 60. Okay, for the LMP, day 12: He did
not eat breakfast pears, for lunch looks like he ate it all, for
dinner he did not eat the tomato soup, half a hamburger, mustard,
pudding, and that's it. And add to breakfast, another cup of
coffee, bag of coffee, excuse me. And the lunch an orange drink,
an orange pineapple, another coffee, graham cracker cubes, 4 of them,
2 pecans and 1/4 of a chocolate bar. And ah - his PRD is 24188,
and 6 hours intermitten sleep, 1-1/2 cans of water, and took
one lomatil last night, just as we were turning in, as a
result of the Evans affair, catching up with the LMP. The CMP
negative reporting again, did not eat: Sausage, fruit coctail,
orange beverage, and for lunch he did not eat the peaches, and for
dinner he did not eat tomato soup, and the carmel candy. Add
to breakfast, coffee, 4 sugar cookies, 4 jelly candies and that's
for breakfast. For lunch, add: lemonade, coffee, 2 pecans and
1/4 of a chocolate bar, 1/2 of a chocolate bar, excuse me. Okay,
his PRD is 15058, he had about 5 hours of fair sleep, and two
sniffs of nose drops, and two lomotil yesterday, and he had
5 cans of water. And that should do it Bob.
CAPCOM Roger, Jack.
SC Thank you for your indulgence.
CAPCOM Thank you for your report. We appreciate it.
SC Houston, 17.
CACCOM Roger, Jack. Go ahead.
SC We thought we'd warm up the cabin. And if
I recall correctly, you approve of us putting inverter 3 onto
Main A and going to manual on the TEMP IN and taking
EVAP temp up to about 59 degrees.
CAPCOM That's affirmative.
SC Okay, Houston, inverter 3 is going on to
Mina A.
CAPCOM Roger. We're watching it.
SC Okay, MARK it.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/18/72 CST 8:31 GET 275:38 994/1

SC And - stand by.
SC Deadband is manual.
PAO This is Apollo Control at -
SC I think we're pretty close, we're showing
about 62 - we'll watch it a little bit there and if it doesn't
come down we'll tweak it again.
CAPCOM Roger, Jack, and the ground is showing
about 60 degrees.
SC Okay.
PAO This is Apollo Control at 275 46 ground
elapsed time. Apollo 17 now 28 hours and 31 minutes from entry
back into the Earth's atmosphere. Approaching Earth at a velocity
of 4397 feet per second. Still 119 924 nautical miles out.
There were 2 pieces of wakeup music this morning. The first
was "We've Only Just Begun" by the Carpenters and the second was an
unidentified Christmas Carol by the neighbors of the Evans family
recorded yesterday. Since awakening, the crew has passed up
their medical and sleep report and food consumption negative
reporting of what they didn't eat out of their daily menu.
Meanwhile, the Spaceflight Meteorology Group of the National
Weather Service said this morning that weather conditions are
expected to be satisfactory.
SC It's almost like having a fire in the fire-
place.
CAPCOM Roger, glad you're comfortable.
PAO Meanwhile, back in the South Pacific, the
weather forecast for the planned landing area, approximately
360 nautical miles southeast of Pago Pago, calls for partly
cloudy skies, widely scattered rain showers, variable winds at
10 miles per hour, seas of 3 feet and temperature of 80 degrees.
At 275 48 standing by, this is Apollo Control.

END OF TAPE

CAPCOM America, Houston.

SC Go ahead, Bob.

CAPCOM How would you like a quick look at sports here and then into the news summary while you're having your breakfast?

SC We'd like the whole thing.

CAPCOM Well, I guess that we all assume maybe you're like the rest of us and turn to your sport page first sometime so we thought we'd recap the pro football action yesterday, in a rather strange day, since there were only 2 games that really made any difference and I think the scores kind of showed the day. In the American Conference playoff games coming up next weekend, Oakland will play at Pittsburgh. Pittsburgh getting into the playoffs for the first time in 40 years. The Cleveland Browns will take on the undefeated Miami Dolphins, who have won 14 straight. In the National Conference, Dallas will be at San Francisco Saturday and Greenbay plays at Washington on Sunday. Quickly recapping some of the scores from yesterday. On that sad, sad one here in Houston, Cincinnati rolled over the Oilers 61 to 17. There were 3 touchdowns scored in the fourth quarter within less than 5 minutes of play. All on interceptions on the part of Cincinnati. New York Giants - it says upset Dallas 23 to 3 - I question the upset since Dallas was already in the playoffs and in what I watched it looked like they were aware that they were already in the playoffs. Buffalo upset Washington 24-17, and again it's a questionable upset because O. J. Simpson had a great day, and Larry Brown from Washington was kept on the bench for the whole game. Oakland 28 over Chicago 21, Detroit 34 over Los Angeles 17. Los Angeles hopes for any playoff berth have been knocked out by San Francisco's win on Saturday, and it looked like they played that way on Sunday. Cleveland - in a real tough one up in New York - with 30 knot winds and gale force winds and lots of snow and cold defeated the New York Jets 26 to 10. Greenbay 30 over New Orleans 20 in a tough one which saw 2, 2 touchdowns being scored off of blocked punts. Kansas City 17 over Atlanta 14, and again, Atlanta's chances for a playoff berth had been wiped out on Saturday and apparently, they played that way on Sunday. Denver 45 over New England 21, St. Louis 24 over Philadelphia 23. Pittsburgh defeated San Diego 24 to 2. On Saturday Miami had taken Baltimore 16 to nothing, and as I previously mentioned, San Francisco defeated Minnesota on Saturday 20 to 17. Just one little note, Jack, you might be interested in this morning's paper, concerning the New Orleans Saints. Dave Parks from the New Orleans Saints, announced his retirement, and he kind of took a rap at the Saints in claiming that they were the team that did not want to win, and that he was retiring unless they would trade him to a winner. It sounds like our friend over

CAPCOM there might have some problems this winter come contract time. In pro basketball last night, the Houston Rockets beat the Cleveland Cavaliers 110 to 109. Jack Marin had 35 points, Mike Newlin had 34. In college basketball, UCLA remains number one in the latest ratings. Second ranked Florida State was beaten this weekend by Princeton, 61 to 59. Third ranked Maryland won, as did fourth-ranked Marquette, fifth-ranked Minnesota and number six, North Carolina State. Indiana is rated 15th, Houston is 16th. We can't find Purdue, Kansas or Cal Tech in the ratings right now. There's one bowl game tonight. Iowa State, who has taken a 5 game losing streak into the Liberty Bowl, will meet Georgia Tech at Memphis, Tennessee. In local hockey, the Aeros and the Los Angeles Sharks of the World Hockey Association, battled to a 4-4 tie. Now, for page one news. The outlook for a quick peace settlement in Vietnam has taken an apparent turn for the worse. The Hanoi government radio announced last night that U.S. planes have dropped more mines in Haiphong Harbor and has also carried out bombing and rocket attacks on the City of Haiphong. There was no immediate comment from Washington on the charges. The snag in the Paris peace talks apparently hinges on a few key points, according to press association reports. Among them, the North Vietnamese will not accept the idea of two separate Vietnamese states, and the method of policing a truce. The two Vietnam policy being the major stumbling block. The weather here is making news. Yesterday's reading at Intercontinental Airport was a frigid 22 degrees. Downtown Houston was 32. The airport reading was the lowest since 1932. Up north in the upper midwest and northeast, it's going to be a white Christmas, and more snow is moving into the area. Chicago had a low of 5 above, Sunday, Kansas City 19, and Albuquerque 18. Anne Armstrong, long a power in Texas Republican politics, is reportedly, about to be named to a high post in the Nixon Administration. Harry Truman still clings to life. The 88-year-old Presi - 88-year-old former President is holding his own, according to his doctors. Debris, found floating in the Gulf of Mexico, off the west coast of Florida, has been identified as that of a Coast Guard helicopter that crashed. Earlier the chopper had rescued 4 fishermen from a sinking shrimp trawler. The helicopter was headed back to St. Petersburg when it went down with the four fishermen and the crew of four. It's a lot safer up there where you are than on the Texas highways. The State Highway Patrol reported a high number of serious accidents on Texas roads this weekend. A Houston newspaper reports that industrial demand for Trinity River system water will not produce enough money to finance the project and that the City of Houston's water and industrial district funds will have to make up the difference. Meanwhile, the Clear Lake City Water Authority is tossing around a proposal that would require developers to pay 50 percent of the cost of all lateral water and sewer lines.

CAPCOM Up around Conroe, in Montgomery County, a transformer blew up Sunday morning and electrical power went out for several hours. Several thousand homes were affected. Baytown was the scene of four armed robberies Sunday. Four business establishments were hit in a 14-minute period. The masked gunmen got about \$500.00 cash. No one was injured. And a final note today in history. Actress Betty Grable is 56 years old. That's from your News Editor, Jim Kukowski.

SC Thank you for the news, Bob.

SC It noted the disclaimer.

SC And you're right, the traffics not too thick up here, as a matter of fact.

CAPCOM Yes, I was wishing -

SC We've been looking for the big man with the white gray beard.

CAPCOM I was kind of wishing it would get a little thicker up there one of these days.

SC It will.

CAPCOM I'm counting on it.

SC Hang in there, Babe.

CAPCOM It looks like we're going to have some good football to watch next weekend. I think they're going to have a pretty light schedule for you all - so - till after the holidays, and we ought to be able to sit back and relax a bit.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/18/72 CST 08:59 GET 276:06 MC-996/1

CAPCOM And one additional weather report, I'm sure, you're interested in. The weather in your primary landing area is looking great and we anticipate no weather avoidance maneuvers whatsoever. Things are great out there. And I'm thinking of going out and enlisting the Apollo 17 Chaplain, so we can maybe get some warmer weather for your arrival, back here on Thursday.

SC Well, I guess if anyone can do it, he can do it if you can find him.

CAPCOM He's been around. We've seen his picture a number of times in the paper over visiting your house there and routing us home.

SC I thought I told him to stay away from there. Only kidding, he's always a welcome addition.

CAPCOM Roger.

SC And I might add, he usually is.

CAPCOM I've got a telegram here, that was sent out to the U.S.S. Ticon, Ticonderoga, I thought you might be interested in. Coming up on antenna switch, I'll read it to you in a minute.

CAPCOM Are you ready for this telegram, that was sent out today?

CAPCOM Okay, would you like to hear the contents of this telegram that went out of here today, to the U.S.S. Ticonderoga?

SC Yes sir.

CAPCOM It's to the U.S.S. Ticonderoga, passed to the NASA Team Leader, says Stullken, we know exactly where the spacecraft is, and we know exactly where's it's going to land. Now, if you can figure out approximately where you are, we will be in good shape. Pull yourself together, and move 50 feet from the target point; let's end this program right signed, The Guys in the Trench, MCC, Houston.

SC Beautiful, Bob, beautiful.

CAPCOM Thought you'd like that one.

END OF TAPE

CAPCOM America, Houston. We'd like you to stop the roll that you're in right now, and stop it roll 60 degrees, be convenient if you'd do it right now, it'd help us keep us on flight plan here.

SC 6 degrees, okay, I won't go to 14 -

CAPCOM No, 60, 60, 60, you're right about there.

SC That's affirm. 60, I'll stop it now.

CAPCOM Okay, and there's some high-gain angles that go with that: Pitch minus 54, Yaw 225. You're on high-gain now, so unless you loose lock you shouldn't have any problem.

CAPCOM America, Houston. We'd like to have the UV cover opened now, if somebody's over there.

SC All right Bob. We may not be by that part of spacecraft for a couple of more hours. Can you hold off?

CAPCOM Well, we don't mind. Although, if somebody's over - it's convenient, we'd sure like it.

SC Okay, I'll make a special trip. UV cover is open.

CAPCOM Thank you sir.

SC Okay, Houston. There are the torquing angles. And, if you're satisfied I'll go ahead and torque.

CAPCOM Roger, Ron. We've got them, and you're clear to torque.

SC Okay, torque 29:30.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/18/72 09:22 CST 276:29 GET MC998/1

SC (garble).

CAPCOM America, Houston. Now that you're not eating and working, we've got a couple of configurations on the H2 tanks and the O2 tank heaters we'd like to have accomplished.

SC Okay, Bob. I was just over there.

CAPCOM Roger.

SC Okay, go ahead.

CAPCOM H2 tank 3 fans to OFF, H2 tank 2 fans to ON.

SC Okay, 3 is OFF and 2 is ON.

CAPCOM Roger, and O2 tank 2 and tank 1 heaters to AUTO if they're not there.

SC Okay, you want 1 and 2 to AUTO. They're going.

CAPCOM Okay, and anytime this morning we would like to get an OPS readout - whenever it's convenient on that.

SC Okay, Bob. It was a thousand after we stopped bleeding last night and I'll check it again in a little while.

CAPCOM Okay. That sounds good enough now. We just needed the reading so we could figure out what to do with it. You might be interested in your consumables. Right now on the RCS you're right on the flight plan at 51 percent remaining. You're oxygen tanks are all either on the flight plan or just slightly above it or within the noise level - maybe a tad below it - you're just right on for all intents and purposes. You're in good shape and your hydrogen is in good shape. You're in good shape on all your consumables.

SC Bob, we've got to go to start our dump.

CAPCOM Say again.

SC Hello Houston, America. We've got to go to commence our dump.

CAPCOM That's affirmative and your waste water dump - we only want it dumped down to 45 percent on your gauge - 45 percent on your gauge.

SC Okay, Bob. I guess we're reading about 52 percent now so we'll dump a little bit.

CAPCOM That's affirmative.

CAPCOM And for whoever is the keeper of the flight plan this morning, we've got a couple of changes to your flight plan in addition to those we called as you were eating there, so we've got a couple additions to it, or changes.

APOLLO 17 MISSION COMMENTARY 12/18/72 09:22 CST 276:29 GET MC998/2

SC Go ahead, Bob.

CAPCOM Okay. The first one is at 281:02. 281:02.
Change the call manually roll left to manually roll left
60 degrees to a roll angle of 071. We want 60 degrees
in a roll angle of 071.

SC Okay, we got it.

CAPCOM Okay. At 281:10 change register 2 of
NOUN 78 there to minus 01974.

SC Okay, got it.

CAPCOM That's it for the flight plan updates
this morning so far.

SC Okay, thank you. And the waste water
is dumped to 45.

CAPCOM Roger. We see it.

END OF TAPE

SC Houston, America. We're about to maneuver.

CAPCOM Okay, we're standing by.

CAPCOM America, Houston.

SC Go ahead.

CAPCOM Jack, we're trying - This is for Jack. We're trying to consolidate and think through what your request was for some sort of a geology surface update. We're just wondering if maybe you don't have the better material at your hands there than we've got down here as far any conclusions or preliminary estimates might be.

SC Okay, I just thought that you guys may have had some new ideas. We had a good briefing last night with Gordy on the surface experiments. I guess we might want to be updated on the orbital experiments, if there's anything new. And new geology, I guess they got it figured for it but I thought they might have had some new ideas or something along that line.

CAPCOM Well, I'm sure they do and I don't mean to short change our geology backroom, Jack, but on the other hand, I think really we're just waiting to get the answers from you or tag up maybe their thoughts with you. And I, you know, from a bystander's standpoint, if I read you anything that they've maybe conclusions that they may have made, we just may be fudging the data because there's -

SC I'm not looking for conclusions, I'm looking for ideas.

CAPCOM Okay, Jack.

SC Tell them don't - don't worry about it. You know, I just thought they might have something to say.

CAPCOM Yeah, they got plenty to say, Jack. But they're down here and they can say it and I think what you ought to say up there is what you're familiar with and just confine it to that.

SC Oh, you count on that, Deke, I just like to think about things.

CAPCOM Rog, you're going to have lots of time to do that. We'd like auto and high gain.

SC Okay, you've got auto.

CAPCOM Thank you.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/18/72 09:51 CST 276:58 GET MC1000/1

CAPCOM America, Houston. We may have not been looking at the right displays at the right time but we didn't see an O2 purge. Did you do O2 fuel cell purge?

SC Sorry about that, Bob. I misunderstood. I thought - I see it now - E2 and O2. I'll go into that now.

CAPCOM Okay. We'd appreciate it. We're just keeping you honest.

SC That's what you need to do.

SC By the way, Bob, that - 59 degrees on the manual temp control setting rated - very comfortable in here.

CAPCOM Real fine - real fine.

CAPCOM We'd like OMNI delta - OMNI delta.

SC Okay.

SC Okay, Bob. I'm up to date on the O2 purges now.

CAPCOM Oh, Roger, Jack.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/18/72 CST 10:06 GET 227:13 MC-1001/1

CAPCOM America, Houston.

SC Go ahead.

CAPCOM About 15 minutes or so ago, we noticed or detected a transfer on your ECS low control, proportioning valve from number 1 to number 2 and we were wondering if the switch ECS radiator low control auto switch is still in the auto position. And if it is in the auto po -

SC It is in the auto position. And we see the 2 here also.

CAPCOM Okay, we're - we'd like to just leave everything like it is and we'd like to go off and study this a while. And we don't -

SC Okay.

CAPCOM - anticipate any problem here in it's number 2 which should work as good as number 1.

SC Yeah.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/18/72 10:30 CST 277:38 GET MC1002/1

SC Here it comes.
PAO This is Apollo Control at 278 hours ground elapsed time. 26 hours and 17 minutes until Apollo 17 reenters the Earth's atmosphere for splashdown near Pago Pago, American Samoa in the South Pacific. Spacecraft at the present time is 114 147 nautical miles away from the Earth, approaching at a velocity of 4600 feet per second. Rather quiet work day for the crew of Apollo 17. Earlier in the day the morning news was read up to the crew after they were wakened by two different musical selections. One of which was recorded yesterday in the Evans home by some neighbors who had come in. And the first one was a rendition of "We've Just Begun" by The Carpenters. The singing group Carpenters, that is. At 278:01 ground elapsed time, this is Apollo Control.

END OF TAPE

SC Houston, America here. We'll probably
VERB 49 out to the thermal attitude.

CAPCOM Roger. We're standing by waiting for
it.

SC Okay. Houston, 17. The OPS is now reading
11 hundred - one one hundred.

CAPCOM Roger, Jack. We've got that data.

CAPCOM America, Houston.

SC Go ahead.

CAPCOM Ron, if you're stowing the OPS. We might
want to hold here a second. We're going to want to dump
that OPS down to as low as possible pressure and we'll be
wanting to give you a GO on that. Let me get on - get
hooked up here around the room.

SC Okay. You know, we've still got it
out. We thought we'd, you know, stow it later this
afternoon sometime.

CAPCOM Okay, fine.

SC You know after we can dump it again.

CAPCOM America, Houston. You're cabin is
down to 4.8 now so you're cleared to dump the OPS any
time and we expect with 11 hundred pounds it would pump
it up to about 5.7 so we'll probably have to stop you,
you know, prior to reaching zero.

SC Oh, okay. Hey, mighty fine. We'll
do it. Okay, Houston, it - OPS is dumping now.

CAPCOM Roger, Ron. We'll watch it.

END OF TAPE

CAPCOM America, Houston.
SC Go ahead.
CAPCOM We've identified a number of cracks and crevices up in the area - any area above the couch plane along the X-axis or just above the couch plane that could possibly be places where the scissors disappeared to. And we would like those areas searched if they haven't been searched all ready. As an example the crack between the top of the main display panel #2 and the hatch opening area, that kind of crack and crevice area there. We would like that looked into. I kind of assume you've all ready done that. We don't want you to remove any panels or anything like that to look in. But, have you looked in those areas, or do you plan to look in those areas here shortly?

SC Hey, Bob. I've looked in some of those things, but just to make sure I've covered everything, and the fact, that we can check it again, why don't we go look again.

CAPCOM Okay.
SC Wait a minute and I'll get my flash light and we can start doing it again, systematically.
CAPCOM Okay.
SC Get the scissors, my dear Watson, scissors.
CAPCOM Seriously, it would have saved a lot of problem if you'd seen them floating out Jack. We would have, just not had to have done any of this.

SC Houston, America.
CAPCOM Roger. Go ahead.
SC Bob, it looks like we're going to make it on this OPS depress. She's reading 0 and she's just barely bleeding out. We're somewhere out 55, so I'm just going to let it bleed out now. And then we'll stow it.
CAPCOM Real fine, real fine.
SC Okay, Houston. Checked her out above MDC #2.
CAPCOM Okay, and ah -
SC Also, looked.
CAPCOM There was the area around -
SC Sorry - go ahead.
CAPCOM most of - the bus excess - the XX struts and the POV vent there, and the other XX strut, you might check - pay particular attention to that area.
SC Yeah. we checked that and also, checked it again, now.
CAPCOM Okay. From our pictures and this may not really be the case, on the above main display panel 3, where the hand hold, the structure part of hand hold, it looks like there's some cracks and crevices right around that, hand hold area that could be between the hand hold and panel 6, that a pair of scissors could slip up into.

APOLLO 17 MISSION COMMENTARY 12/18/72 CST 11:10 GET 278:17 MC-1004/2

SC Okay. We're looking around there and it looked like they could ah - well they could possibly get in there maybe. But anyhow we checked it and they're not there.

CAPCOM Okay, and then on the other side of the cockpit in the same area, around hand hold, back behind the crevice area back behind the COAS power panel, that's panel 15, and the hand hold. And then also, that little area in front of the hand hold, where the cut-out for main display panel 2, you might look, take your light and look in there.

SC Okay, I'm over there now.

END OF TAPE

SC Okay, Houston no joy on their part either.

CAPCOM Okay, Ron, the next couple are really down in the lower equipment bay area, and then I've got one area up in the tunnel - 2 areas up in the tunnel that are suspect areas. And then that does it. Which would you like first?

SC I'm up in the tunnel, now.

CAPCOM Okay, the tunnel area - the only thing we show up there is the 4 hand holes around the tunnel. I don't think a scissors could get up there, but maybe they could slip in something like that. Anyway, those 4 hand hole slots up there, you might check in those 2 areas.

SC The scissors couldn't fit in those hand holes, but I could check them. Something else might be in there.

CAPCOM Okay. The - oh, and the only other one up in that area, Ron, and I assume you've put that outlet bag over the cabin fans. We wouldn't want you to fool with that at all because it's probably all full of dirt and everything, but if you didn't - then the outlet to the cabin fan area might be a central place.

SC Uh, let's see, we installed that the first day out I think. And it's been on there every since.

CAPCOM Yes, we assumed you did. I just was trying to cover all bases, here. Okay, the last 3 items - I think you've actually called one of them - are down in the lower equipment bay. One of them is the crack just below panel 101 - down in the lower equipment bay - I think you called that one the first night didn't you?

SC Not below 101, huh uh.

CAPCOM Okay our pictures show a crevice below 101, and also while you're right there, I don't think it's even - there's a crevice above the door for the optics stowage area, you might check up in there. It might have lodged - And also, while you're right there, Ron. Our picture, of course, shows your hoses stowed and they kind of come out right there to the right of panel 120 - the optics stowage area. And so you've got some area behind those panel - behind those hoses and that where it might have lodged, but I believe you had to move those in order to do your EVA yesterday anyway.

SC Yes, the hoses in the tunnel have all been moved around in here as far as the hoses are concerned. I still think that the biggest possibility is right above the optics stowage, and that's what I was talking about before. Because it's about - oh, an inch - you know, a crack is at least an inch deep in there and as long as the optics stowage thing itself.

CAPCOM Okay, and - let me - we had one more recommendation for you. And then, over panel 250, there's a little bitty opening - it shows in the pictures - over panel 250.

SC Okay, we'll check that in a second here.

CAPCOM Our only thoughts, Ron, on the - any other position that you might see - you know if it's above the couch plane and you really think it might be a suspect area, you might consider taping the crack, if you desire. The tape probably isn't going to hold it in if it wants to come tumbling out, but it's something you could do if you wanted to.

SC Okay, I understand that Bob. That's a good point.

CAPCOM And Ron, while we're talking to you, we'd like to tag up with you on one more item unrelated to the scissors search and that is your headset situation. And we just want to leave the - make sure you're going to do as we said last night and will not plug that headset with the broken wire you will not plug in again and we'll arrange your entry configuration in some configuration that does not require that headset to be plugged in. Is that affirm?

SC Yes, that's affirm, Bob. I'll buy that. What I'll do, I'll wear it as a bump hat - you know - and then use the light weight headset with the - you know the earplugs underneath that. Put the light weight headset around my neck, and then have the mike sticking up in front of me, and with the ear plugs on under - I tested that particularly, and it's comfortable and no problem, and it'll work. But I will not plug in the comm carrier at all.

CAPCOM Roger, we just wanted to tag up with you on that - that's what we'll be expecting and we'll put this to bed forever.

SC Okay, mighty fine.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/18/72 11:31 CST 278:38 GET MC1006/1

SC Houston, America.

CAPCOM Go ahead.

CAPCOM Go ahead, America.

SC Okay, Bob, we got the major compartments inventoried and stowed frankly with the exception of the things we need, of course, between now and then in the sleeping areas and what have you. We'll finish that off, of course, as we finish up with gear and as we get up in the morning. But there's very little left to do and any contingency weight changes, which there may be just a couple at the most, we'll inventory those and give them to you in the morning.

CAPCOM Roger.

end of tape

APOLLO 17 MISSION COMMENTARY 12/18/72 CST 11:47 GET 278:54 MC-1007/1

CAPCOM America, 17. Say again, 17, Houston.

SC Go ahead.

CAPCOM I've got an interesting little press release here. Jack Schmitt, and I'm sure all of you will be interested in. Based upon your work up in the Shorty area, on the surface, the people out of Flagstaff, went back and looked at the Apollo 14, 250 millimeter camera. And frames from - and showed that it had colored frames that showed brownish and orangeish colorations on a bulbous dome in the Crater Langrenus, and on a 4-kilometer dark halo crater on the ejecta blanket of Cilopidus, and they've made that news release today.

SC Very good. We may have triggered something.

CAPCOM Yes sir.

SC Okay Bob, I'm on that maneuver.

CAPCOM America, we'd like OMNI DELTA.

SC You have OMNI DELTA now, Bob.

CAPCOM 17, Houston. OMNI ALFA.

SC You've got it.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/18/72 GET 279:24 CST 1218 MC-1008/1

SC Houston, America, we're going to high gain.
CAPCOM That's affirmative.
CAPCOM America, you can go to Auto on the high
gain.
SC You got it.
CAPCOM Thank you.
SC Houston, America.
CAPCOM Go ahead, America.
SC Okay, we might be 5 or 10 minutes late on -
on starting the ALFMED, we're still putting some sensors on.
CAPCOM Roger.
SC Hello, Bob.
CAPCOM Yes.
SC Can you get a reading - is it the same
two subjects on ALFMED as we had going out, or is this a case
where you want it on all three of us. It's not exactly clear.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/18/72 12:36 CST 279:43 GET MC1009/1

CAPCOM Jack, we agree with you that it's not clear and FAO tells us we want two - the same two subjects wearing the blindfold as on the transearth codes as was on the translunar codes.

SC Okay. All this has been chained and that's the way we'll do it.

CAPCOM Roger, Gene.

SC Houston, this is Jack.

CAPCOM Go ahead.

SC Yeah, we've got pretty good COMM attitude here. Ask FAO if they want them on VOX and if they also want the notes recorded up here.

CAPCOM Okay, I'll check on that.

CAPCOM The easiest way to do it would be just go ahead and do it on VOX and we'll get everything recorded down here.

SC I agree because taking notes is good when you're having drop outs but it's hardly the same as tapes.

CAPCOM That's affirmative and since you do have - you're locked up on COMM and high-gain and that, just go ahead and we'll record it all down here for you.

SC Okay.

CAPCOM Jack, Houston.

SC Go ahead.

CAPCOM This is your option, Jack, but if you want to you can put the other set of blindfolds out and see what you see too. And box and give us the data.

SC Roger. Maybe I will. What the problem is, though is that I noticed that one things start going with 2 they were starting to interfere and 3 might do the same thing.

CAPCOM Okay, your option.

SC I may put them on anyway.

CAPCOM It's your option and no problem.

SC I may put them on just to watch.

CAPCOM Roger.

SC It's the only movie we have this afternoon.

PAO This is Apollo Control at 279 hours 50 minutes ground elapsed time. Apollo 17 spacecraft, America, now 109 179 nautical miles from Earth, velocity increasing ever so slightly - now 4784 feet per second. 24 hours 27 minutes away from entry and splashdown tomorrow afternoon in the South Pacific. The crew, at the present time is preparing to conduct the light flash visual

APOLLO 17 MISSION COMMENTARY 12/18/72 12:36 CST 279:43 GET MC1009/2

PAO phenomenon experiment on the flight
plan time. A few minutes late perhaps, if anything. Jack
Schmitt may or may not don the third set of eye shields
to -

CAPCOM Go ahead.

SC Roger. Would you ask the surgeon to
check to see if the command module pilot is alive and well?

CAPCOM Okay, there's seeing data. It looks
sort of squirly and - but it looks - they want it to settle
down for a little while.

SC - Critical, part.

END OF TAPE

SC Got to unplug that there.
SC Yeah, I'm ready.
SC Okay, Bob, CDR and CMP have got their blind-
folds on.
CAPCOM Roger.
SC I got it.
SC Okay, we're starting.
SC Houston, this is Ron. While we're getting
a darkened atmosphere, probably won't see anything for a while,
let me just record on the tape my impression of these light
flashes as they occurred around the Moon and at other times. In
general, they've all been essentially - as I said a flash, with
little bit of a glow, and usually in one eye or the other eye
and for some reason both generally they've been kind of - you
don't want to say it's in the periphery of your vision because
you get the feeling that maybe there was a flash over to the left
or down to the right or something like that. But you don't get
a distinct impression as to where the flash came from. Well,
you can see where it came from, but not - you can't see the flash
itself. Like it was just beyond your vision; and both of them
have been like that. At one time, and one time only throughout
the flight I can remember kind of a triple flash, so to speak.
And in that case, there was a bright flash in the left eye on -
about 10 o'clock in the left eye. And then it repeated itself
again about 2 o'clock in the left eye. And then about, oh, 10
o'clock, a quarter of the way out, in the right eye. I just
started a blink, blink, blink just like that. Three of them right in a
row. And the rest of the time, though, they've all essentially been
single flashes to me.

SC This is Gene here. I'll just remark
that both Jack and I did see them on the lunar surface. I
guess the best summation I can make of that is I think I saw both
lines and then the spots or the flashes a little bit more sharply,
but that might be because of the adaptation - dark adaptation
in the LM prior to going to sleep was probably a little
bit better. And I guess it's awful hard to tell time when you're
under - when it's dark, and it's my guess, I want to say they
were quite frequent and I'd say that means two to three a minute
now. That could be way out, but that's what I'd guess.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/18/72 CST 12:56 GET 280:03 MC-1011/1

SC (Coughing)
SC (Coughing) I don't see any.
SC Coughing.

END OF TAPE

CAPCOM America to Houston. We haven't heard anything. Have you seen any flashes at all?

SC Haven't heard a - haven't seen a thing, Bob. Can't understand it. Same here from the CDR. I haven't seen anything.

CAPCOM Roger. I understand. Your heart rates are down pretty low - like maybe you fell asleep or something.

SC Oh, no. The LMP dozed a couple of times but - I thought I saw one, Bob, but, I'm not sure. I squinted hard about that time. I may have just triggered something.

CAPCOM Roger. Okay, we're just standing by.

SC The last time we were in PTC, were we not?

CAPCOM Yes you were and that's one reason you had to copy it down because we kept losing COMM on you.

SC As I recall, they seemed to come in batches when - when I was taking notes. Is that what you people observed? Or recorded, rather.

CAPCOM That's affirmative, Jack, and the thought that occurs, of course, is that you may be blocking with shielding on the spacecraft somehow.

SC Houston, has my biomed settled down?

CAPCOM That's affirmative.

SC Okay.

END OF TAPE

SC No, I haven't been able to see any flashes. I rotated 180 degrees along the rotation axis along Z and saw no change - LMP.

CAPCOM America, Houston. The light flash observation is up and we'd like to move on into the flight plan. And this call - it is for Ron -

SC Hey Robert.

CAPCOM The EMS entry check is on at 281 as shown. We'd like you to do that now prior to the maneuver which is at 281 or delay it until about 281:50 when you're not maneuvering. We'd like to do that check when you are not in - not maneuvering.

SC I'll go ahead and do it now.

SC What's going up here? Going up here. Which is supposed to go up first?

CAPCOM You can do it now. You've got about 5 minutes prior to the VERB 49 maneuver.

SC Bob.

SC Up in the. EMS check. Okay, why don't you go over it now.

SC Your eyes all right?

SC Put off a chance to open your eyes. Yeah.

SC That must be something, the fact that we didn't even see a flash.

CAPCOM It would probably tell you that there's a point source and the spacecraft that's blocking it somehow.

SC Or the Earth. Or the Moon, I believe it.

CAPCOM O yeah, yeah, yeah. I didn't want to get technical. Something's blocking them, that's right.

SC (laughter) Why should we even have seen them, I can't wave at - at them. Okay, Ron, why don't you go ahead and do that, huh? I just put mine up.

SC Okay, I'm on page 1-3 and the EMS function is off. Circuit breakers are closed. EMS mode to standby. And function to test 5 - or test 1. EMS to NORMAL.

SC Okay, the hairline is over the notch or the test pattern and it's test pattern number 4. Okay, 05 G light came on on test 2. Go to test 3. Okay, it's 10 seconds and the down light came on. Okay, it should be 8 .0 in the range counter there. Okay, test 4 - she's counting down and the trace went down. Going straight along. Mark it. 10 seconds. 0.0. How about that. And it stops at the lower right hand corner of the page. Okay, with test 5, trace went up and 10 sec later the upper light came on.

END OF TAPE

SC Okay, we'll go to range center. And let the
(Garble) cool down a little bit. And the trace moves on up to
zero. It looks like it worked good, Houston.

CAPCOM Roger. Sounds great.

SC Okay, we'll go standby and off.

CAPCOM America, Houston.

SC Go ahead.

CAPCOM Just some words for Ron, when he gets into
the P20 option 2 the maneuver there, was tried on the simu-
lator and it got out to 71 degrees on the middle gimbal angle.
And it got a gimbal warning light, although 71 degrees is the
maximum yaw angle they got.

SC Okay, we'll try it.

SC Bob, for your recorded information there,
mag Tango, Tango on the 35 millimeter camera frames, let's see,
8 through 13 have the ALFMED prime observer position data on
them.

CAPCOM Roger, we've got it recorded.

CAPCOM Just is another piece of data, guys, on
this maneuver you're in right now, it should go out to a
67 degree middle gimbal angle right to this maneuver.

CAPCOM America, Houston. We'd like to close UV
cover until we're in attitude now.

SC Okay, we'll close the cover.

END OF TAPE

SC Okay, cover is closed.
CAPCOM America, Houston.
SC Houston, this is America. Go ahead.
CAPCOM Roger, we've got a procedure we'd like to go through to eventually put the ECS radiator's flow control over to AUTO and we have a bunch - several steps we'd like to go through before you do that move.
SC Okay, wait a minute, I'll write them down here so we can -
CAPCOM Roger, are you ready to read it or copy it?
SC Okay, go ahead.
CAPCOM Okay, on panel 5 the ECS radiators controller circuit breaker AC1, verified CLOSED. Panel 2 ECS radiator's flow controller to position 1. ECS radiators flow control power to OFF center, then power. Wait 20 seconds. ECS radiator's flow control to AUTO. Over.
SC Houston, America.
CAPCOM Go ahead.
SC Do you suspect it was a power glitch or do you think the controller actually failed, and you're just going to verify it?
CAPCOM Negative on either of those cases. We've just had lots of spurious changes in the past history on flights. John's sitting here saying you had a number of times on 10, and so, since we're not, we just think the power controller probably saw a temperature glitch or something and we think it will just come right back - no problem.
SC I - come to think of it - I guess we did, now that he recalls it.
CAPCOM Would you like OMNI CHARLIE?
SC Okay, OMNI CHARLIE.
CAPCOM And while you're there we'd like the UV cover to OPEN, now.
SC Okay, we'll open the UV cover.
SC Okay, Houston. I'm ready to proceed on this PITCH maneuver.
CAPCOM Roger.
SC And Houston. The readback on the flow controller, there. We'll check panel 5, ECS radiator control circuit breaker AC1 verified CLOSED, then we'll put the ECS flow controller to position number 1. And we'll turn the ECS flow controller power OFF at center.
CAPCOM It's off center, Ron, and then up the power.
SC Okay, I couldn't figure out my writing, okay, that's right, the powers off center and then back to power, then wait 20 seconds and put the ECS flow controller on AUTO.
CAPCOM That's affirmative.

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SC Houston, America. You want to start that now?

CAPCOM That's affirmative. Any time. And in case you're wondering about that middle step, that's a reset and a logic step by going off on the power and then back to power.

SC Okay.

SC Okay, ECS flow controller is going to position 1, okay ECS power is OFF, and then back to power. And we're waiting 20 seconds - okay flow controller is going to AUTO now and stays gray - it looks like.

CAPCOM That's what we expected. And needless to say, Ron. We'll be watching your ECS system very carefully for you just in case it flips back - we don't expect any problem.

SC Okay, mighty fine.

END OF TAPE

CAPCOM And America Houston. I've got a midcourse
7 and a mid-pac entry pad.

SC Okay. Just say one please.

CAPCOM Roger.

CAPCOM And, America, Houston. We'd like to bring
up the high-gain, so we can get the dump going and get the
data down, it's a Yaw plus 15, Pitch 204. Say again Pitch
plus 15, Yaw, 204.

SC Okay, pitch 15 Yaw 204.

CAPCOM Roger.

SC Houston, America.

CAPCOM Go ahead.

CAPCOM Go ahead, America.

SC Okay, I assume this line in here stop Pitch
rate at 146 degrees means stop at 146 degrees in pitch, is
that correct?

CAPCOM Rog. Stop at 146 degrees pitch.

SC Okay, thank you.

SC You've got the high-gain, which you
haven't told us, Bob.

CAPCOM And, America, Houston. I've also, besides
these pads, I've also got a flight plan update for the first
one item 282:10, either one you want to take first.

SC Okay, why don't you go ahead with the
flight plan update first.

CAPCOM Okay, Gene. At 282:10 manually, manual
roll left 40 degrees, fire to the VERB 49 maneuver. Insert
manual roll left 40 degrees. That'll give you a roll angle
of 342, prior to starting that maneuver.

SC Okay, I've got it.

CAPCOM Okay, the next one's quite a ways over.
It's at 284:55.

SC Okay, I've got it.

CAPCOM Okay, first thing at 284:55, we'd like
a VERB 48, first register, 11102, second register 01111,

SC Okay.

CAPCOM A VERB 49 maneuver to lunar sounder thermal
attitude at 28500, the attitude is Pitch 122, say again, roll 122,
Pitch 065, Yaw 047, That's 122 065 and 047. High-gain angles with
that will be pitch minus 24, Yaw 160.

SC Okay. At 28500 49 to roll of 122, pitch
065, yaw 047, high-gain is minus 24 and 160.

CAPCOM Roger, Gene. And then at 285:10 where
we had you right in the antenna retrack, we want you to
delete that. The purpose of the maneuver above that is to
heat up those antennas and we will retract them on a cue from
us, when we feel the temperatures are warm enough.

SC Okay, what about the radar off set point.

CAPCOM Delete, radar off, also.

SC Okay, I've deleted the whole update at
285: 10 I had.

CAPCOM That's affirmative.

SC Bob, Jack's ready to take the PAD.

CAPCOM Okay, they just pointed out, there's also
VERB 48 at 285:10 which is not applicable, either.

And Jack I've got the mid-pac area, say again. Let's do the
midcouse 7 pad first. MCC-7.

SC Go ahead.

CAPCOM RCS/G&N 2, 6, 7, 3, 5. NOUN 48's are
not applicable. 3, 0, 1, 1, 7, 5, 7, 7, 8, plus 0, 0, 0, 1,
9 plus 0, 0, 0, 0, 0 minus 0, 0, 0, 0, 1, roll is 082, pitch
041, yaw 331, HA not applicable. Plus 00229, plus 00019,
004, 00019, Sextant star is 31 3289 344 rest of the pad is
not applicable. And in case I cut out and came off my key
to fast, back up there in noun 81, that's a plus all 0s for
delta VY. Set stars are Sirius and Rigil. 256 152 069 its
a 4 jet plus X. Assumes a PTC REFSMMAT. Over.

END OF TAPE

SC Okay, Bob, I assumed that Delta VZ was plus all zeros also.

CAPCOM No, I'm sorry. Delta VZ was minus all zeros .1 - .1 on Delta VZ.

SC Okay, midcourse 7 readback. RCS G&N 267 35 NOUN 48 is NA; 301 17 57 78 plus 00019 plus 00000, plus 00001. 082 041 331. HA is NA plus 00229 00019 004 00019 31 3289 344. Rest of the pad is NA. Sirius and Rigel 256 152 069. 4 Jett plus X. Service PCT TZ REFSMMAT.

CAPCOM Roger. One change. On Delta VZ on your NOUN 81 that should be a minus 00001 - minus 00001.

SC Roger. Thank you - minus 00001.

CAPCOM Okay, Jack. That got us warmed up for the midpack area entry pad.

SC Go ahead.

CAPCOM Midpack area - 000 153 000 304 01 37 268. NOUN 61 - minus 1789 minus 16613 064 36090 649 10472 36172. RRT time -304 18 37 0028. NOUN 69's are non-applicable. DO 400 0208 0017 0337 0739. Sextant Stars 13 1173 155. Boresight Star is non-applicable. Lift vector is up. Over.

SC Okay, Midpack area - 000 153 000 3040 137 268. Minus 1789 minus 16613 064 36090 649 10472 36172. 304 18 37 0027. NOUN 69 is NA. 400 0208 0017 0337 0739. 13 1173 155. Boresight is NA. Left vector up. Over.

CAPCOM Roger. The RET of 05G is 0028. 0028.

SC Okay, I'll change that to 28 for RRT 05G.

CAPCOM That's right and I've got one - seven assumptions here, or comments.

SC Go ahead.

CAPCOM Comment 1 - Use non-exit EMS pattern. Comment 2 - RET 90K.

SC Go ahead, Bob.

CAPCOM Roger. Comment 2 - RET 90K 06 01 RET mains 08 26 RET landing 13 18 break break UV cover closed please.

SC Okay, it's closed and Bob your cutting out every once and a while. I missed your comment one.

CAPCOM Okay, Jack lets try comment 1 over again. Use non-exit EMS pattern. Comment 2 - 90K time 06 01 mains 08 26 landing 13 18. Comment 3 - COS and G is roll right. Comment 4 - GET of Moon set 304 16 13. Comment 5 - assumes midcourse seven MCC 7. Comment 6 - assumes entry REFSMMAT. Comment 7 - GDC aliine for entry REFSMMAT stars are Sirius and Rigel. Roll 273 pitch 256 yaw 347. Over.

CAPCOM America, Houston. We'd like AUTO on the high gain and we'd like you to do that manual roll and VERB 49 maneuver, which is listed at 282:10. We'd like you to start it now.

SC Okay, Bob.

SC Hey, Bob, I don't think your 342 is going to work out. I've just, correction, if you will. Roll left - left 40 degrees.

CAPCOM Okay, I'm just sitting here, staring at FAO, and asking why it doesn't work out. Let me handle that. That's fine.

SC No, it. Hey, Bob, it will. I was thinking of roll right. I'm on my way left now, and we will get 342.

CAPCOM Okay.

SC Close to it. We'll get about, about, let's see now, 20, whatever, whatever 360 minus 20 is. That's about 342.

CAPCOM Okay.

SC Okay, Bob, we're there.

CAPCOM Roger.

SC Bob, I press right on to the VERB49?

CAPCOM That's affirmative. Press right on with the VERB 49.

CAPCOM We're just using this as a little addition here to get more time, more thermal heat on those antennas.

CAPCOM America, Houston. We'd like OMNI Delta.

SC Okay, Bob. I gave it to you a few minutes ago.

CAPCOM You got one on INCO that time.

SC The first one.

END OF TAPE

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CAPCOM
open please.

America, Houston. We'd like UV cover

SC

Okay, it's open.

CAPCOM
We've got a state vector that goes with those pads we've
called up.

America, Houston. We'd like ACCEPT.

SC

Okay, Bob, you've got ACCEPT.

CAPCOM
We gave you about a 15 minute bonus on your eat period there.
You can jump right into the eat period if you want.

And you can get into the flight plan.

SC

Okay. Thank you Houston.

CAPCOM

America, Houston. The computer is yours.

SC

Thank you Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/18/72 15:05 CST 282:12 GET 1020/1

CAPCOM America, Houston. This is for Ron. It looks like one of your sensors may have come loose so we're getting bad data. And don't interrupt your eating but when you get a chance you might try and push them on or service them or whatever needs to be done.

SC Okay, I'll get it. Is it by any chance printing up right now?

CAPCOM Naw, it's correct according to the -

SC Upside down in the tunnel.

CAPCOM Okay. Do you like eating that way. Is that the new trick?

SC I don't see how his family can live with him. We're not going to be able to do that for very much longer you know.

CAPCOM About 21 hours and 52 minutes.

SC

PAO This is Apollo Control at 282:27 ground elapsed time in the Apollo 17 Mission. Twenty-one hours 51 minutes until reentry into the Earth's atmosphere tomorrow afternoon in the South Pacific. The crew presently is in the evening meal. Just after the completion of this eat period is the great press conference in the sky starting at approximately 5:00 central time with the onboard TV turned on. Earlier in the afternoon the initial midcourse 7 numbers were read up to the crew. Ah, for ground elapsed time of ignition at 301:17 velocity change of 1.9 feet per second. Also, the initial entry times and the post-entry event times were passed up to the crew assuming that midcourse correction burn number 7 is performed. Presently the spacecraft is 101 703 nautical miles out from Earth. Velocity gradually building now 5080 feet per second. Flight path angle staying at about minus 6.49 degrees in the present tracking. Current numbers on entry interface ground elapsed time of 304:18:37. There will not be a change of shift press conference for the off going Gold Team. And at 282:29 ground elapsed time this is Apollo Control.

ENF OF TAPE

PAO This is Apollo control at 282 hours
51 minutes ground elapsed time. Apollo 17 now 21 hours and
27 minutes away from splashdown or actually entry back into
the Earth's atmosphere tomorrow afternoon in the south central
Pacific. Presently, 100 586 nautical miles out from the
Earth streaking in at a velocity of 5 126 feet per second
which will build up at the time of collision with the atmos-
phere to about 36 100 feet per second. The entry tomorrow
afternoon will take place at approximately 304 hours 18 minutes
ground elapsed time which is about 1:11 central standard time
and at 282 hours 52 minutes ground elapsed time in the mission
of Apollo 17. This is Apollo control.

SC Houston, America.

CAPCOM Go ahead.

SC Okay, Bob I've kinda fiddled around with the
sensors now are they working okay now?

CAPCOM Stand by, Ron. Ron, your sensors look
good right at the moment.

SC Okay, good enough.

SC Hey, Houston 17.

CAPCOM Go ahead, 17.

SC Yes, we'd like to run a check here on
this TV set up. Are we going to disturb you if go to TV on
the S-band off switch?

CAPCOM Stand by on that let me check with oso.

SC And Bob if it is an inconvenience could
you look ahead and find the time where we can have 10 or
15 minutes if possible to work this out.

CAPCOM Roger.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/18/72 CST 16:00 GET 283:08 1022/1

CAPCOM America, Houston.
SC Go ahead.
CAPCOM You can have the TV switch to TV for about 35 minutes starting right now if you'd like. And, while - if your working around there we would like to take battery A off charge and put battery B on charge.
SC Okay, it's in work. And, we probably won't need it for that long and we'll get back with you as soon as we can.
CAPCOM Roger.
SC Okay, we're in TV now.
SC Okay, Bob, battery B is on charge and 7 alpha reads 1.3.
CAPCOM Roger, we got that.
PAO This is Apollo control at 283 hours 16 minutes. We've completed a shift handover in mission control. Flight director for this shift is Charles Lewis the spacecraft communicator astronaut Gordon Fullerton. The crew is completing their meal at this time and beginning preparations for the televised press conference which is to begin at 5 p.m. central standard time. Apollo 17 at this time is traveling at a velocity of 5 178 feet per second just under one mile per second and is 99 350 nautical miles from Earth.
SC Okay, Bob I'm going to pick up the manual and go right for the verb 49.
CAPCOM Okay, Geneo you've got a new capcom now.
Good evening.
SC Good evening, Gordo, how are you doing?
CAPCOM Real fine how about you.
SC Very fine. I'm going right for my verb 49 maneuver now.
CAPCOM Okay.
CAPCOM America, Houston, we need OMNI charlie please.
CAPCOM America, Houston suggest you try to get the high gain up at a pitch of 10 yaw 210.
SC Pitch 10 and yaw 210 okay.
CAPCOM Roger.

END OF TAPE

CAPCOM America, Houston. We're sole up to DSE or science data and so if you're through with the TV rehearsal, we'd like the AUX band, the S-Band AUX switch back to science, so we can get the rest of the data real time.

SC Okay. We just finished. We're going to science.

CAPCOM Roger. Thank you.

SC Hello Houston, America.

CAPCOM Go ahead.

SC Gordy, how far out are we?

CAPCOM How far out? 100 000 miles approximately.

SC Okay. Thank you.

PAO This is Apollo Control at 283 hours 58 minutes. And we're about 9 minutes now from the start of the televised Press Conference with the Apollo 17 crew. The network controller has checked out the lines from Goldstone, California to Houston.

CAPCOM A little more precise answer. You're 97 500 miles and you passed the half way point about 2 hours ago. And we're going to have a site handover here on the hour.

SC Got all that, Gordy. Thank you.

PAO The television pictures from the spacecraft will be received at the 210 foot dish antenna at Goldstone, California and relayed to Houston.

SC Hello, Houston, America.

CAPCOM Go ahead, America.

SC We'll stand by for your call to power up the TV.

CAPCOM Roger.

CAPCOM America, Houston. We're ready for TV.

SC Roger, Gordy.

END OF TAPE

SC Okay, we're going to TRANSMIT on the TV now.

CAPCOM Roger.

SC And, let us know when you've got a picture.

CAPCOM Will do.

CAPCOM America, Houston. We've got a picture.

Looks good, looks in focus, and we see the flag in the patch.

SC Okay.

SC Houston, here's the crew of Apollo -- Apollo 17, Spaceship America.

CAPCOM Roger, Apollo 17. If you're ready for the questioning, I'll begin.

SC Go ahead, Gordo.

CAPCOM Okay. As usual in these inflight news conferences, the questions that will be asked of you were prepared by correspondents covering the Apollo 17 mission at the Manned Spacecraft Center in Houston. They will be read exactly as written and in the order determined by the newsmen. The first question is for Jack Schmitt. If you, as a geologist, were coming home from a field trip on Earth, you'd be drafting a preliminary report and discussing it with fellow geologists. In terms understandable to laymen, can you summarize what you would be saying in your preliminary report about your field trip to Taurus-Littrow?

SCHMITT Well, I'll -- I'll give that a try, Gordie. I think the thing we had hoped to accomplish at Taurus-Littrow was to look at a -- as broad a spectrum of the history of the Moon as possible in one small area, as the concluding flight to the Apollo Program. And, I think we did that. I think we had look -- did look at some of the oldest rocks that it is possible to see with our capability in the breccias of the South and North Massifs. I think we saw some intermediate age rocks of fairly unexpected character, I believe, and the subfloor crystalline or igneous rocks, the gabbro, as we called them there, and we also understood, I think, that those rocks, in fact, had intruded into the breccias of the North Massif. We found, I believe, in the -- at the Crater Van Serg, on the third EVA, that the regolith, or the garden zone, on the top of that subfloor gabbro, or the igneous rocks, was quite thick, or appears to be very thick, which is an expected result, and we'll -- hopefully, those rocks will have much information about a fairly extended period of lunar erosion. And, we found that there was indeed a dark mantle over the area of -- learned there was indeed a dark mantle over the area of variable thickness, but, apparently, of relatively recent age, and that in turn had a light mantle of material of which we do not yet understand, and I think that the samples are going to have to tell that story. It may well be a land

slide that has come off the South Massif. And, then, possibly as important as any finding, we found that even later than that relatively young light mantle deposit are avalanche -- possible avalanche -- we have alteration reminiscent of the alteration by hot waters or hot gasses on Earth, and that was the orange -- appears to be the orange soil that we found around the crater Shorty. And, subsequently, in orbit we started to pick up, and particularly through Ron Evans' efforts, pick up more and more of the apparent evidence of such alteration taking place in fairly recent time on the Moon. All of those items, I think, are extremely significant and go through the full range of our present knowledge of lunar history. And, a report I would write would initially summarize that particular sequence of events.

CAPCOM Question number 2 is for Jack, again. What other probable explanations besides volcanic origin do you have for the orange rock and colored soil that you found at Shorty Crater?

SCHMITT Well, they don't necessarily have to be volcanic, Gordie. I refer to them as alteration, and much of the hydrothermal, or hot water, alteration we see on Earth is related to recent volcanism, or ancient volcanism, but, also, we know of that kind of alteration of preexisting materials to take place as a result of just fluids working their way up through the Earth's crust, and I presume that such a process is also possible on the Moon. The ones we saw seem to be associated with areas of dark mantle of various types, and most of the photographic evidence we have is of those dark mantle deposits are associated with volcanism, but it is not necessarily proved yet, I believe, that the -- the orange soils or the alterations we've seen are volcanic. However, the process would be a related process, that is, one of the tunnel origin.

CAPCOM The third question is for Cernan or Schmitt. Your voices are so much alike that it is unclear to some of us which one of you found the orange rock and who first spotted the layer of orange soil on the crater rim.

CERNAN Jack found it. He uncovered it as he was walking on the rim, and we worked with that, and then, I went around the crater to take the Stereo base pan from within the crater, I could see alterations (garble) down from the rim further beyond where we were working down to the center. I don't think that that question of who found it is specifically as important as that that we were there with the equipment and the training jointly to not only recognize that, but to take advantage of having recognized it, and I hope that we did.

CAPCOM Okay. The next one's for Ron Evans. Why do you think you were able to see so much orange material

from lunar orbit after your partners had found some on the ground where none of the previous Apollo crews reported seeing anything but greys, tans, and browns?

EVANS Well, I think, for one thing, that we were in, essentially, a different orbit than some of the other crews that had been up there before. And, you know, each of us has a color tone in our own eyes. What we come up with, I think, is a function pretty much of what you'd like to believe and what you'd like to see out of things. If you feel it has a tint of orange with it, and this is in a new area that we really haven't flown over that much, and this is primarily -- where we were seeing this type of thing was on the western rim of Serenitatis, and some of the -- well, it leads -- it looks like known volcanic deposits along the rim of Serenitatis.

SC Gor --

END OF TAPE

SC Gordy, let me add quickly that there's no such thing as a truly objective observer and I believe that once you start looking for something, and when Ron heard about what we were doing, I'm sure he started looking himself, to see what we had seen. That leads you to see things. Now that's not seeing things that are not there, it makes you look for things that are there and that's extremely important and that's where the kind of training all three of us have had and I think this made it possible for us to find a lot of things that might not otherwise have been found.

CAPCOM Here's one addressed to all three crewmen. What will you remember most about this mission?

SC Boy, that's a loaded question, Gordie.

SC There's a - so many things but I think probably the thing that - when I think about it - that will stick with me most is the same thing that stuck with me - a for my last two missions - not so much being there, but it's getting the chance to get home and share what you've seen and what you've done with other people.

SC I think in my case, the lift-off itself was something brand new for me. It's something beyond - the booster ride itself was something beyond what I could humanly comprehend. So, I think that's - a - oh - it's a very important part of it. I will always remember that part of it. But I'm kinda like with Gene, I feel that even though the three of us had been up here and had the opportunity to observe the Moon, look at what we could find and that type of thing, I think that we have an obligation to share our experiences with the rest of the people.

SC Well, Gordy, that is a difficult question. It has been a fascinating experience from so many detail aspects. I guess generally speaking the thing I carry back with me, I hope, is an increased perspective not only for the history of the solar system, but I hope for the future of mankind with in that solar system.

SC Gordy, this doesn't mean that that last 50 000 feet won't stick in my mind for a long time.

CAPCOM Roger, Gene. Again for all three crewmen. Now that you are returning home from what may be the last lunar exploration of this century, what short range and long range plans do each of you have for the future?

SC Well my short range plans are certainly to enjoy Christmas with my family. Ah, think about the flight, get it's data down on paper. My long range plans are to turn around and look at the next flight whenever that may be and put my efforts and experience toward that flight and get to work on it.

SC I think my short range plans, of course first of all tomorrow I want to make a real good reentry, and that's kinda the real short range part of it. From that point on, as I mentioned before, I think we have a responsibility, at least I feel we have responsibilities, to share our experiences with the rest of the people not only in the United States, but with the people of the rest of the world. Beyond that I also have a strong desire to continue participating in manned space flights in whatever capacity that I might be able to.

SC Well, I can do nothing but echo Gene and Ron's words and maybe add, Gordy, that I hope that through the next few years I'll be able to make some contributions, that guarantees that this Apollo flight is not the last exploration program in this century in space.

CAPCOM Again for all the crew. Throughout the mission there were periodic reports from each of you about gastric distress in one form or another. Does this trouble make you think that the three skylab missions of 28, 56 and 56 days scheduled for next year are too ambitious?

SC No, not at all. I don't think they are too ambitious, Gordy. I think that's the reason we're flying each and everyone of these flights one at a time. To find out if there really are potential problems in diet or what have you. And I think we solved a lot of them from Apollo 15 and 16 and those few that we had I'm sure we can solve accordingly prior to Skylab flying.

SC I don't think I can add anything to that.

SC I think we've made a big improvement over the problems that occurred on Apollo 16 and I think as a result of our observations in conjunction with the medical people, primarily NASA, that solution - a clear solution will be found for Skylab and any other mission we want to fly.

CAPCOM Okay. Ron Evans. You seemed almost euphoric during your space walk yesterday and other space walkers before you seemed to have had this same reaction to the experience. Can you describe what it was like and how it made you feel?

SC Well I think for those of you who had the opportunity to watch yesterday, it is pretty obvious how I felt out there. I'm not sure euphoric if the word. I - it's an opportunity - well to me I guess it was an opportunity to be what I call a "real space man". And - you're out there in the deepness of space, there's nothing there but your spacesuit on and you're doing the job that has to be done. And we're riding around in space out here, and this is in a capsule

and we look out the window you know, but it's a nice firm feeling it's a solidly built vehicle and you get the zero g effect on the thing, but you don't get the feeling of - really getting out and walking in space. And once I became accustomed to what it was like in the EVA environment, then you relax and you take it easy, you try to accomplish what you can and observe what you can and really enjoy it. And I think really enjoyed it.

SC I had a hold of his umbilical most of that time and I didn't notice that he was ready to jump out into space if that's the kind of euphoria you're talking about.

CAPCOM Okay. For Eugene Cernan and any other later comments. You talked a lot about this mission being the end of the beginning, but a lot of people don't agree. Recognizing the United States is stopping lunar exploration in the foreseeable future, how do you feel?

SC When we look back at the Apollo program I don't think anyone can privately to themselves and publicly say that this truly indeed has really been a beginning - a beginning of man's really first venture out into deep space. And once there's a beginning, there's a continuation. The probing into deep space by man, the next landing on the Moon, a trip to Mars may not be for 10 years, a decade; it may not be until the end of this century. But I personally have faith it will happen. I think it's a restraint, an abnormal restraint of man's intellect at this point in time to restrict or tend to think that he will restrict his own feeling of exploration. His own quest for knowledge. He's had an opportunity. He's proved that he could take advantage of this opportunity and I think that's the nature of mankind is going to just press on. That's why I believe not probably Apollo 17, yes, it's a beginning; but the whole Apollo program is really the true beginning of what's to come in the future. And I firmly believe that. We can look back in a hundred years or two hundred years and the five year or ten year period of time, we may be slowed down here. I think we'll be - we'll be lost in the merit of what is really accomplished during the next several decades.

CAPCOM The next question is for all the crew. The American people seem to be getting fairly blase about space flights and television coverage of Apollo 17 has been at a minimum. But this is not the case aboard. For example, in the Republic of Zaire, the former Belgian Congo, an estimated 20 million people are watching extensive coverage on TV sets set-up in the villages. What do you have to say to the people of underdeveloped nations?

SC Well, Gordy, first of all I'm not sure that the amount of television coverage is necessarily a measure of the interest of the American people. I don't have those figures at hand. I'm sorry to hear that the adventures we had and the insight that maybe we gained into not only ourselves, but to the history of the solar system was not shared extensively with the American people, if that's true. As far as the rest of the world is concerned, and also the people of the United States who may not participate as much in the affluence that we all would like to share, I think that what space flight in general and Apollo Program in particular has offered, is many new avenues from which we can provide for those people abroad and for our own people, the kind of quality of life and the material - including the material quality of life that everybody aspires to. I think we've just begun the adventure of understanding how what we've learned and how we've learned to do it in space can be applied to these particular kinds of problems. That is one of the great challenges that I think NASA and other agencies within the United States Government and other Governments abroad have, is to use this base of technological information now for there own people.

END OF TAPE

SC I'd like to just add to that very briefly, Gordie that America has led the way into space in the past. I believe we will in the future. But, a point I tried to get across several days earlier in the flight is that the real promise of the future for all the people of the Earth is to weld themselves into a coherent group of people who can live and work together and then enjoy all the benefits and all the knowledge that is to come from future space explorations. I think we are doing this not just as Americans but as human beings and everyone throughout these countries throughout the world who are watching us right now are also human beings no different than we are. It's their accomplishment as well as it is ours.

CAPCOM Question 11 is for Jack. Do you think the United States waited too long to send a geologist to the Moon.

SC We're grinning because I think we predicted that question. Gordie, I think the United States waited too long to go into space in the first place and I think their probably going to wait too long to go back. I will always feel that way no matter who goes or what qualifications he may have or may think he has. I think that the most important thing that maybe I have done is to - to be able to show that we can build a transportation system that allows you to fly people over a wide variety of discipline. And I think that we have shown that and I think that it's occurred at about as soon as possible within the Apollo program.

CAPCOM The last couple of questions are in lighter vein and for Ron Evans. There has been a lot of discussion about missing pair of scissors in the command module. Who really lost the scissors?

SC Well, I think it must have been one of those other guys because I was asleep and I got up the next morning and it was gone.

SC Didn't happen on my watch.

CAPCOM And also Ron did the squeaking of those mice onboard keep you awake?

SC No, the mice really didn't - there are plenty of other things going on inside the spacecraft here that we can hardly even hear the mice. As a matter of fact I really haven't heard them yet.

CAPCOM Okay, this completes the list of questions submitted by the newsmen here in Houston. There are a little less than 7 minutes left on our scheduled time for any other further remarks you might like to make.

SC Yes, Gordie I think we'd like to take this opportunity to each say a word or two.

SC Well, just briefly Gordie I feel that I have done something that's very significant here in my life. I hope that - and will do everything I can to see that it is not the most significant thing I ever do. But, I feel that the fact that I had the opportunity to do in a large part to the tangible and intangible affects that my mother and father had on my life and to them I send my thanks and I hope that I continue to live up to their expectations.

SC You know on Apollo 17 here we've had two outstanding vehicles and that's the - don't let me get you wrong I'm not just trying to boost her either. But, I've watched a lot of people work on a lot of spacecraft and I'm very proud to be able to say that all the vehicles that have been associated with Apollo 17 have been outstanding. And, the reason they are outstanding is because the people have been working on them. And, I'd like to give our thanks and the well done to people who worked on our spacecraft.

SC Gordie, prior to leaving and I guess I can certainly assume during the flight we've carried many many well wishes and very many prayers aboard from people throughout the world. I personally believe that those prayers played no small part in any success that we were able to achieve on this flight. I asked those people however to continue their prayers and particularly for some of our friends and some of our comrades who are still in southeast Asia POW's MIA's who may not although God's willing I hope, but who may not have the opportunities to get home and enjoy the Christmas that we're looking forward to. And, with that from Apollo 17 spacecraft America on December 18, 1972 we all wish you a very very merry Christmas and a happy holiday season. God speed and God bless you all.

CAPCOM Thank you guys. That was a good show we enjoyed every minute.

END OF TAPE

SC Okay, Gordy. I presume you want to go back to science in the COMM configuration, and we're getting squared away here for a big VERB 48.

CAPCOM Okay. That's affirmative. Back to science, please.

SC Gordy, if you like, I'll go ahead and maneuver now.

CAPCOM No. We want to hold the maneuver until 55.

SC Okay.

CAPCOM America, Houston.

SC Go ahead.

CAPCOM Okay, we're ready to go with that VERB 48 and then the VERB 49 as listed a little bit early here. That'll put us in the hot soak attitude.

SC Okay, Gordo. Be with you in about 30 seconds.

CAPCOM Okay.

SC Houston, America is on her way.

CAPCOM Oky doke.

SC Houston, 17's getting the high gain up, if you want it.

CAPCOM Yes. We think we're already on it Jack.

SC Well I meant to have the other angles.

CAPCOM I think you can just leave it alone. It is holding some during the maneuver and should hold until the end of it.

SC Okay.

SC The maneuver's over Gordy.

CAPCOM Rog.

SC Now we're even.

SC Hello Houston, America.

CAPCOM Go ahead.

SC Okay, Gordy. With these relatively fixed attitudes most of the afternoon, we got the, the tunnel totally dry, but the forward hatch is awful wet. I just thought I'd throw that out.

CAPCOM Okay.

END OF TAPE

PAO This is Apollo control at 285 hours 14 minutes. At the present time in mission control we've got a group of engineers from the crew systems division clustered around the capcom console going over a set of recommended procedures which capcom Gordon Fullerton will be discussing with Ron Evans for fixing his communications carrier the so called Snoopy hat that the crew wears that has the earphones and microphone attachments built in. Evans reported several days ago that the comm carrier - communications carrier was intermittent and last night he took it apart looked inside and found that in fact a couple of wires had broken and made a temporary fix. The procedures that we'll be reading up to him are to ensure that so far as possible that the Snoopy hat communications carrier is fixed up to work properly during entry. If for some reason the Snoopy hat carrier couldn't be used Evans would plan to wear the light weight headset using the Snoopy hat to hold it in position but the preferable arrangement during entry would be to have a working comm carrier built into the Snoopy hat. Apollo 17 at this time is 93 270 nautical miles from Earth. And the speed is 5 444 feet per second.

SC Houston America if you're ready we'll maneuver.

CAPCOM Stand by we're checking. Not yet temperatures aren't up as high as they would like them. We'd like to hold five minutes at least.

SC Okay, we'll just stand by for you call on the maneuver.

CAPCOM Okay.

PAO This is Apollo control at 285 hours 24 minutes. Here in mission control we're at the present time being paid a visit by a jolly gentleman in red cap and coat with white whiskers who is going around the room dispensing things from a bag of goodies.

PAO For flight director Chuck Lewis out of Santa's bag is a toy flight directors console for Skylab complete with spinners. A can of Skylab food for capcom Gordon Fullerton.

CAPCOM America Houston.

SC Go ahead, Houston.

CAPCOM You guys aren't going to believe this, but Santa Claus just walked in the MOCR with a long white beard, red suit, black boots and all and he's passing out presents to everybody.

SC How did he get there before we do. We just saw him up there about five days ago.

APOLLO 17 MISSION COMMENTARY 12/18/72 CST 17:51 GET 284:59 1028/2

CAPCOM Well, he beat you back.
SC Gordie, I'd believe anything. Has he
got anything with our name on it?
CAPCOM I'll ask him I don't see anything yet.

END OF TAPE

CAPCOM America, Houston. You can go ahead and start the V49 maneuver. Have a change in the high gain angles, though, as printed there. Make it a plus 30 and 190, instead of minus 40 and 90. That's a plus 30 and 190 on the high gain.

SC Okay, I got a birdie.

PAO Flight Surgeon, John Ziegelschmitt, received a small telephone for private conversations out of Santa's bag.

SC Gordy, when you get a minute, would you ask one of the surgeons there what my heart rate peaked out at in the last 15 minutes or so.

CAPCOM Okay, I'll do that. I'm just looking at some of the presents here. Mine was a little Skylab flute can, flip top can, says CAPCOM's post flight dinner. I'm pretty sure there's absolutely nothing in it, but I'm afraid to pull the lid off. The surgeon's got a little plastic telephone that says "For Private Conversations ONLY".

SC (Laughter).

CAPCOM And your heart rate went to ...

SC I'd be more worried about what might be ...

CAPCOM Your heart ...

SC You ought to be more worried about what might be in that can, Gordy.

CAPCOM Yes, I am. Geno's heart rate peaked at 115 to 120.

SC Okay, what did the LMP's peak at. He wasn't doing anything.

SC I'm not even on Biomed, as a matter of fact, Gordy.

CAPCOM Oh I'm sorry. My mistake. Not the surgeon's. That was the LMP's. Stoval, on the front there, got a little shovel like gadget, with a sign on it that says "Trenching Tool".

SC Beautiful.

SC I thought they might give him a coin. A flippable coin.

CAPCOM He's got a coin like that. It says "CSM Active" on both sides.

SC That's what I figured.

CAPCOM America, Houston. We're ready for a spin up now.

SC Okay.

SC We're spinning, Gordy.

CAPCOM Okay. It's looking good.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/18/72 GET 285:54 CST 18:46 MC1030/1

CAPCOM America, Houston. We'd like to throw a few switches on panel 230 and try to get the HF antennas retracted. Over.

SC Okay. Go ahead.

CAPCOM Okay. First of all, radar OFF.

SC Okay, Gordy, the radar is OFF.

CAPCOM Okay then HF antenna Number 2, retract and give us a mark please. It should take about, little over 2 minutes.

SC Okay, going to retract. Mark it. Oh, HF2? Gordy, I started 1. I'm sorry.

CAPCOM That's alright. Keep it. It doesn't matter, just keep working on 1 there. Keep it in retract.

SC Okay, it's in retract and stayed there.

CAPCOM America, Houston. As you come up on roll of 30, we'd like you to, okay, break, break, we would like the antenna 1 switched to OFF now.

SC It is off.

CAPCOM And we got a good retract. Okay, for the guy on the ..

SC Gordy?

CAPCOM Go ahead.

SC It was still barber pole when I went to OFF.

CAPCOM Okay, that's the one we had trouble with before. That's what we expected. Okay you can go number 2 to retract now.

SC Okay, number 2 retract. Mark.

CAPCOM Okay, and for whoever is driving the spaceship there, we'd like to stop the roll, stop the PTC at a roll angle of 30, instead of what's in the Flight Plan. That's 30 degrees and you're passing through 73 right now. Over.

SC Okay, Gordy. I got it. I'm looking at NOUN 20. We'll stop it at 30.

CAPCOM Okay, and I have different high gains to go with that attitude. They'll be minus 24 and 206.

SC Okay. We got them.

CAPCOM Jack, Houston. You should be retracting now. Have a gray and you can go OFF as you as you do.

SC That's affirmed and congratulations. And the switch is OFF.

CAPCOM Okay, and those high gain angles I passed you are probably misleading. It looks like the high gain ought to just hang on when you stop this maneuver.

SC Okay.

CAPCOM America, Houston. It'll be about 5 or 6 minutes until we finish the dump before we can go ahead with the VERB 49, in case you got something to do.

SC Okay, Gordy. Thank you.

APOLLO 17 MISSION COMMENTARY 12/18/72 GET 285:54 CST 18:46 MC1030/2

CAPCOM Okay, America. We're ready for the maneuver
now.
SC Okay, Houston. Here she comes.
SC America is on her way again.
CAPCOM Okay.
SC Gordo I can see two DAP changes here. You want
to change this one during the maneuver or after the maneuver. And
then the next one before the next maneuver.
CAPCOM We would want the DAP load, after you get to
attitude, and then the other DAP load before you start the next
maneuver.
SC Sounds. That sounds good here. Okay.
CAPCOM America, Houston. We need the UV cover
closed. The Sun's getting in there.
SC Closed, Gordy.
CAPCOM Thank you.
CAPCOM We should be safe now. Open the UV cover
please.
SC Gordy, it's open.
CAPCOM Thank you.
SC Doesn't it bother you to wheel such power,
Gordy?
CAPCOM I'm getting accustomed to it.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/18/72 19:09 CST 286:16 GET 1031/1

SC Gordy, for the first time in seemingly several days, we see the Earth.

CAPCOM Rog. Standby for a weather report.

SC (laughter) Afraid I don't know whether or not there's any weather down there.

CAPCOM Cause you can't see to much of it, huh?

SC No, sir. You're down to a fingernail if you'll pardon the expression. It - oh, let's see - it's about a - what do you think Gene? - about a 1/8 Earth? 1/6 to 1/8 Earth?

SC Got a picture, Ron. You can see it later.

SC Hello, Houston, America.

CAPCOM Go ahead.

SC Hey, Gordo, 286:52 on the flight plan and 287:40. Is there an update on that CMP biomed LMP doff biomed harness on oh, I guess 4 to 6 hours ago.

CAPCOM Yeah, let me check on that. I - there was something on this when I left last night but I have to get the latest here.

SC Okay.

end of tape

APOLLO 17 MISSION COMMENTARY 12/18/72 CST 19:24 GET 286:30 1032/1

CAPCOM America, we're ready now for steps at
1 - 286:43 CMC mode 3 in auto, verb 48 verb 49 and so forth.
On the biomed we're going to leave it up to you. Whoever,
draw straws or whatever - whoever you decide to wear the
biomed tonight it's your choice.

SC That's easy Jack and I will put it on in
the morning how's that.

CAPCOM Okay.

SC You get to watch tenth of America tonight,
then.

CAPCOM Okay, captain.

CAPCOM America, Houston. We'd like OMNI alpha.

CAPCOM America, Houston. We can take the high
gain now that your there. The angles in the book minus 37
and 48 and auto.

CAPCOM America, Houston. We're ready for verb 74.

SC Coming at you, Gordo mark it.

CAPCOM Okay, we got a good dump thank you.

SC Okeydok.

CAPCOM America, Houston, over.

SC Go ahead.

CAPCOM Okay, we've been thinking about the
busted Snoopy hat and have a suggestion on a configuration
that we'd like to present to you as an alternative to the
plan you mentioned earlier. See what you think about it.

SC Hey, Gordo.

CAPCOM Go ahead.

SC Can you hold off with that update. Ron's
off the headset right now and it'll be a few minutes. I'd
like to hear him - hear him hear that.

CAPCOM Okay, and just as a brief introduction
before he gets on. We're really thinking about let Jack have
the broken one - nothing personal Jack but, think that it's
probably more important that you and Ron have the all up ones,
over.

SC Yes, we've already discussed that, but
let Ron talk over with what his plan is and let's hear yours.

CAPCOM Okay, give me a call when your ready.

SC Okay, for food to thought you might think
about that we looked at a way of just taping the electronic
part of the light weight headset right to his helmet. It
looked pretty good so chew on that one for a while and we'll
be back with you and you can come up with your plan.

CAPCOM That sounds like that's our plan essentially,
but I'll go through it in case there's anything that either
you or us haven't thought of about it.

SC Okay.

APOLLO 17 MISSION COMMENTARY 12/18/72 CST 19:24 GET 286:30 1032/2

CAPCOM America, Houston.
SC Go ahead.
CAPCOM We'd like to give you what EECOM has
said should be the final H2 fan configuration for this mis-
sion. H2 fan 2 off and 3 auto.
SC Okay, H2 fan 2 is going off and 3 to auto.
And this is a truly historic event.
CAPCOM It's been a pleasure to share it with
you, Jack.
SC Isn't that the way we started. Isn't
that the way we started.
CAPCOM I think it is, affirm.
SC Very appropriate. My congratulation and
my hat off to the EECOM.
CAPCOM Thank you, sir.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/18/72 CST 19:56 GET 287:03 1033/1

CAPCOM America, Houston. We'd like you to spin it up on B2 and D2 and we have one change in the high gain REACQ and NARROW angles. Instead of a yaw of 90 we want a yaw of 45.

SC Okay, I'll set them at a yaw of 45.

CAPCOM Roger.

CAPCOM You probably weren't aware of it, but your IR is chilly. Would you turn it on up until bedtime to warm it up a little, please.

SC Okay, that's only appropriate. IR is on.

CAPCOM Roger.

SC Okay, Gordie I just spun up America for you.

CAPCOM Thank you.

PAO Apollo control at 287 hours 32 minutes.

It's been a relatively quiet period in the control center and aboard the spacecraft. Apollo 17 at the present time is rotating slowly about the X axis with it's ultraviolet spectrometer pointed toward Scollatic sources of ultraviolet. The crew will be conducting some housekeeping activities aboard the spacecraft changing the lithium hydroxide canisters. They have one more eat period before retiring for an 8 hour rest period at 290 hours even. And, we're now showing some 16 hours 45 minutes until Apollo 17 enters Earth atmosphere. The spacecraft now 85 800 nautical miles from Earth and velocity increasing to 5 795 feet per second.

END OF TAPE

SC Houston, America. The CMP is in Biomed.
CAPCOM Okay, CMP.
SC Very good.
CAPCOM This probably isn't too good a time to
have an emergency.
CAPCOM The reason I say that is we got a big
Chinese feast going on here in MOCR.
SC Oh, you do?
CAPCOM Had some food brought and everybody's
topping America right now I must admit.
SC Oh, oh.
SC Houston, America. How's the delivery
girl situation there. Is it as good as it used to be?
CAPCOM Oh yes. Better if anything.
SC Outstanding.
CAPCOM Ron, I have some words on, our suggestion,
probably the same as what you've done already on rigging up the
headsets for, for entry tomorrow anytime you have a free moment
to listen.
SC Oh, sure. Go ahead. Everybody's just sit-
ting here right now.
CAPCOM Okay. Geno mentioned that you'd already
essentially taped the electronic part to your Snoopy hat. I
guess, first of all, we're suggesting that you rig this up
for Jack and let you have the good one. Just to be sure. And
I'll, I'll quickly run through the steps we have. I think
maybe this will be the easiest way and you can then listen,
and if you've done it already, or if it's mentioned something
that you haven't thought of, then we'll at least accomplish
a job. They have about fifteen steps here, but I don't think
it'll take long to summarize it. They suggest taking the
headband off the light-weight headset, in other words taking
the electronic part off the headband, straighten the mike boom,
and straighten the COMM carrier boom, the appropriate one for
whichever ear Jack wears his molded ear piece in. Then, rotate
the light-weight headset mike boom 90 degrees. They found that
was necessary to get it to face your mouth when you end up with
this all taped on there, you have to sort of twist it, force
it 90 degrees. Then lay the light-weight head set boom along the
COMM carrier boom with the electronic part on the outside of
your ear piece on the Snoopy hat. And the hose that goes to
the molded ear piece facing downward coming out down and with
the mike boom 1 inch beyond the COMM carrier mike boom tip.
And then tape the two booms together for the entire length of
the COMM carrier boom. And then, re-bend the whole works back
so that the tip is back in front of your mouth. And then tape

CAPCOM the electronics box onto the side of the ear piece and you can run tape all the way around the lower part of the ear piece and you can lift up on the leather-covered doughnuts on the inside there, pull that loose and then run tape underneath, just pull the lower part of it loose, run tape all the way around it really securely anchor the electronics box to the outside of the, the ear piece, so there's no chance that that will slip off, or shift. Then you can kind of push the leather ear seal back down on top of the tape inside. Let's see, then ...

SC Yes. So far, so far we're right with you.

CAPCOM Okay. Then take the COMM carrier electrical lead and double it back on itself and tape it together so that it doesn't flop around. And now you've got it essentially set up. I've lost my place here in the sequence. Just a second. Okay, place the molded ear piece to, well, actually one further modification was then, to run the hose, which is now external, up underneath the leather doughnut, and out through the ear opening and pull it on through. Now you, to put this all on, you'll have to stick the molded ear piece in your ear and then as you pull the Snoopy on, sort of pull the slack out of the audio hose there, so you don't end up with a lot of hose coiled up in the ear cup. And the remaining hose then just sort of dangles down beside your neck. Fasten chin strap and make sure that the hose isn't pinched anywhere. Readjust the mike boom to a half inch from your, in front of your lips and make sure one of the foam parts of the mike boom is facing your mouth. Okay, then you just route the electrical lead and the the plug on down through the slot and the ICG and put, put all the excess length of the connectors and the excess stuff down inside the ECG so it doesn't flop around and of course mate the pins, connectors and snap the ICG closed at the front to be sure that it'll capture. One thing they did try in this configuration is, was to see if you could get the helmet on over all that, in case a suited re-entry became necessary at short notice, and it does go on. Randy Hester tried it and with just a little cocking of the head you can get the helmet on over. How's that sound to you?

SC Okay, Gordy. That sounds essentially what we were thinking about. We hadn't got to the extent of trying to hook them up yet, you know, put them together yet, but we're thinking along the same lines anyhow. And you brought up a couple of points that's good.

CAPCOM Okay, if you got any questions or anything, I've got a demo model sitting right in front of me here, so that we can just discuss it real time as you get it set up. I assume you're going to try to work that up tonight. Is that right? Is that right?

END OF TAPE

SC Yes, we can I guess. Okay, and the reason you'd rather have Jack do it than me is simply because of the redun - I can't say the word, redundancy.

CAPCOM That's affirmative. It gives you and Gene the best equipment and we see no reason why this won't work, but like you said it's only one mike in place of two on the other ones.

SC I'm surprised you didn't have us tape two headsets to the Snoopy helmet.

CAPCOM Well Jack, we'll just take that chance.

SC Well, it took 14 days but I finally know where I stand.

CAPCOM I do have a question - well, first of all I give you a little weather for the south pacific tomorrow if your interested.

SC Stand by and let's get the commander on the headset here in a minute then you can pass it up.

CAPCOM Okay.

CAPCOM Not bad.

SC Well, I'll let her go this time.

CAPCOM Okay, we got them.

SC Okay, we'll torque at 59:45.

CAPCOM Alrighty.

CAPCOM America we would like to stop the roll this time around as you come up on 146 roll.

SC Okay, we'll stop it on 146 roll.

CAPCOM America Houston. When you get her stopped there we'd like you to hold the attitude until we get the DSE dump before doing the verb 49.

SC Okay, Gerdo we're there now.

SC Houston, America. We can take those words on the weather in the recovery area if you like.

CAPCOM Okay, it can be summed up by one word excellent. 2000 scattered and high scattered forecast I'm looking at a satellite picture high resolution satellite picture that shows you in the middle of a big high and see just very faint hint of clouds in the area. And, the trend of the weather movement is such that you're going into an even clearer area but tomorrow the wind will be 090 at 10, visibility 10, 2994 on the altimeter. It's of no consequence to the Navy guys but the land lubber will be glad to learn that there is 3 foot wave heights and temperature is 77 degrees. Over.

SC Sounds like a fighter pilot's day to come aboard. I think they will be able to take those seas.

CAPCOM Rog. Okay, you can start the verb 49 if you wish.

APOLLO 17 MISSION COMMENTARY 12/18/72 CST 20:47 GET 287:54 1035/2

CAPCOM America, Houston. One other request you might be thinking about and that is any deltas to the nominal entry stowage that we might not know about. We'd like to know about before you go to sleep tonight so we can think about the CG.

SC Okay, Gordo, we'll be able to give you those.

END OF TAPE

APOLLO L& MISSION COMMENTARY 12/18/72 21:05 CST 288:12 GET 1036/1

CAPCOM
spin it up.
AMERICA

America, Houston. Now we're ready to
Okay.

END OF TAPE

PAO This is Apollo Control at 289 hours 8 minutes. We'll be putting the crew to bed in about an hour, actually about 50 minutes from now. And they're eating dinner at this time. No major item scheduled on the Flight Plan between now and the time they begin their sleep period. During the night, the Flight Dynamics Officer and the Retro Return to Earth Officer will be compiling their last stretch of tracking data on the spacecraft and computing the final midcourse correction which would be performed at about 3 hours prior to entry. At the present time that midcourse correction would appear to be very small, around 2 feet per second. Apollo 17 at this time about 80 000 miles from Earth and the spacecraft velocity going through 6000 feet per second and we'll see an ever more rapid buildup in that velocity as the spacecraft nears Earth.

SC Hello, Houston, America.

CAPCOM Go ahead.

SC Gordo, we're just finishing chow and doing a little cleaning up and double checking the stowage and so forth. But we do have a minute. Is there by any chance any late news, anything going on today that might be of interest?

CAPCOM Okay. I haven't heard of anything. You did get a news report this morning. Is that correct?

SC Yes. We sure did.

CAPCOM Okay, I'll see if there's any Delta's in that. It'll take me a couple of minutes.

SC Okay. How's the Houston weather today?

CAPCOM It was overcast, but warmer. Kind of standard Winter weather for around here. Not nearly so frigid as it has been the last couple days.

SC Oky doke.

SC Hello, Houston, America.

CAPCOM Go ahead.

SC Okay, Gordo, the entry stowage will be as - as in the Flight Plan Supplement, with the exception that there is a, a small lab jettison bag, max weight of about 25 pounds, which will be, which is already, as a matter of fact, packed in A-7.

CAPCOM Okay, we got that.

SC And the presently used jettison bag weight really isn't very much at all. That's just for housekeeping trash and so forth. We will tie between A-2 and A-3 and there's probably not, at the most, more than 5 pounds there.

CAPCOM Okay.

SC And right now, we haven't seen any specific spot to tie down the LEVA's. If you've got a recommendation, we'll take it. If not, we'll just pick a spot down in the IB area to tie them down.

CAPCOM Okay, I'll see if we have a plan for that.

END OF TAPE

CAPCOM America, Houston, I've got an update to the news.

SC Okay, Houston, America's listening.

CAPCOM Okay, it's some more like human interest stuff rather than pure news. One thing in the liberty bowl football game Georgia Tech beat Iowa State - well I guess it's not quite over yet this is a fourth quarter Georgia Tech 31 Iowa State 24. And, there is a story about the Moon ship that's streaking smoothly homeward. There's nothing in it that you don't know about, though except maybe one little part of the article describing quote from William E. Fastie of John Hopkins University member of the orbital science team who said that a rather startling discovery is the Moon is simply not degasing. It has nothing left in terms of anything that can create an atmosphere. Much to his surprise even the amount of hydrogen an element that should have been the most abundant outgasing candidate turned out to be about one percent of it's predicted value. He speculated that the absence of a planetary magnetic field on the Moon works the purge surface of any atmospheric accumulation. The atoms of gasses that have vented to the surface he theorized pick up an electrical charge and are then swepted away by the solar wind which is a stream of electrified atoms pushing far out into the solar systems of the Sun. Former president Truman is stabilized is the word they are using now. His heart condition is unchanged. His kidneys are failing him and he's termed to be still in a very serious condition, but resting confortably. A declining birth rate and a desire for fewer children in the years ahead had caused the census bureau to reduce sharply it's estimates of future population growth in the United States. By the year 2000, for example, the estimate is now twenty million fewer people than had been forecast on the basis of previous statistics. Reduction could have major implications for American Society in many areas and it reflects changes in birth and child planning which now suggests that the U. S. may eventually reach zero population growth. The last one is pretty interesting, and more so if you can see the picture that goes with the story, about James L. G. Fitzpatrick who for 40 years has been interested in copying natural flight and he has now designed a batlike flying machine that may be ready for a test run next summer. Fitzpatrick said that the first, that first every small part of the ungainly structure must be tested carefully otherwise you end up either in a disaster or a grave and we try to avoid that sort of thing. After 3 decades of trying, Fitzpatrick who's 66, believes his latest

CAPCOM device comes closest to the real thing although it still needs a small motor to flap the wings. Asked whether his device, as yet unnamed, works on the flight principal of a bird, he said I don't know any one who knows what principal a bird works on, but I guess this is more like a bat or a pterodactyl. Fitzpatrick's winged copter or flapping wing airplane is equipped with cockpit controls that include a throttle, that regulates the one horsepower engine and up and down flight. Other equipment include rudder pedals to regulate a power steering system, a parking brake, a pseudopaddageium, I don't know what that word is, it's a new one on me, to transfer power from the engine to the wings, and a 2-way radio. It has a maximum 40 foot wingspan and weighs 320 pounds. It is 6 feet long and it looks like a cage of scaffolding covered in parts by canvas. He said he's far enough along on building his device that he will be able to test the way the wings move in the Staten Island Community College Gym by the first of the year. However, there will be no free flying. The gymnasium test will involve tying weights to the wing tips and flapping the wings. He said that his bird is rather slow in maturing and it's been a long gestation period which involved 9000 hours of experimentation, 40 000 dollars in his money and the dissection of 300 birds of various species. I've been interested in flight since 1930 he said. Basically I was curious as to why various things flew and I've been painfully finding out ever since. And he winds up with a real quote here. He said never has so much been done with so little success. That's the news. No, wait a minute, one final closing story. In Atlanta, Georgia a 5 year old boy crawled up on Santa's lap in a department store and asked him what Santa would need if he had 2 boots and 1 sock. Dick Wright, a Georgia State University graduate student in the off season, said he thought quickly and replied another sock and the child punched him in the stomach.

SC Huh, Merry Christmas. Thank you for the news, Gordo.

SC That's a very enjoyable evening to go to bed with on our final night of the flight.

CAPCOM Before you turn in we got a little shopping list to run down with you if you, nothing to right down, but, if you're ready to listen.

SC Okay, go ahead.

CAPCOM Okay, the surgeons, are first of all, request that Ron press on his sensors, they're looking like they're getting loose according to the data here. They also recommend for Ron that if he's still using the nose drops, I guess he has been, they recommend that he

APOLLO 17 MISSION COMMENTARY 12/18/72 CST 22:30 GET 289:36 MC-1038/3

CAPCOM take one decongestant pill before going to sleep and one after breakfast in the morning. It's a suggestion, it's his option, the thought being it might help in clearing your ears during that final descent. You may leave the optics power on for more heat in the cabin if you wish. We'd like you to stop charge on battery B. Over.

END OF TAPE

SC Okay, take that off the line now. Off the charger.

CAPCOM Okay, and we'd like the IR OFF.

SC Okay, it's OFF Gordy.

CAPCOM Okay and we owe you an answer on what to do with the LEVA's. I guess they were suppose to be on the helmets in the PGA bag. Is that going to be a real pain to get at and put them there?

SC No, it's not going to be a pain at all, Gordo, it's just impossible.

CAPCOM Okay, well -

SC There's just no room in there at all - not - none at all.

CAPCOM Okay, I'll probably not have an answer for you tonight but first thing in the morning - someplace to put them.

SC Okay, it won't be any problem to stash them somewhere but we though maybe you had a better idea than we did, if not when get our rock bags tied down and all in place we'll take a look at a good spot for the LEVA's and let you know.

CAPCOM Okay, GNC - I don't know where you are on the check list - let's see - just a reminder to zero the optics before you turn in. And I'd like to say for the whole white team who are just - here in another hour will finish up their - their work with the Apollo program, and myself included, that this sure has been a pleasure working with not only the two best spacecraft the program has seen but we think the best and most cooperative and a - crew also and it's been a privelege in my estimation and a real pleasure too, and looking forward to seeing you on Thursday.

SC Well, Gordo, those are awful kind words, and we too appreciagate it very much but I think you know how we feel about the help you guys give us down there is what really makes our job easy up here. From the Cape back to the Pacific it's the guys from the trench all the way up to the top back there and that's what it's really all about. We thank you, those are good words, but just consider them reciprocal also.

CAPCOM Thank you.

SC And we appreciate it there white team.

CAPCOM Thank you, Ron.

SC Gordo, we'll hang on the air here and we're going to finish up our pre-sleep check list and we'll just give you one final buzz before we go off on the voice switch.

CAPCOM Okay, very good.

SC By the way, the Earth is sure starting to get big.

CAPCOM Okay, you're about 80 000 miles out.

SC Okay, outstanding. I guess, based upon your mid-course 7 that that's a good sign, isn't it? - That it's getting big?

CAPCOM That's what it's suppose to do.

SC It's a - although there's not much of it to see, it's really sort of spectacular because the crescent is getting smaller and smaller although the Moon is getting - is getting larger and of course the crescent we're looking at now is the Pacific but even if there were land masses in there I don't think we could see it much besides the reflection off the clouds - and a - well, in this case, the ocean - but - it's really a pretty spectacular sight because out the other window, now that we're on a inter-vertical PTC we've got a full Moon looking back at us and it's sort of a poetic place to be the night before entry.

CAPCOM Yeah, I'll bet it is.

SC Hang in there, babe, and we'll see you for sure Thursday.

CAPCOM Okay, it's a deal.

END OF TAPE

AMERICA Houston, how's the CMP biomed now?
CAPCOM Okay, Ron, looks real good.
AMERICA Okay, mighty fine.
CAPCOM I got a final on the Liberty Bowl. Must
have been exciting. John Young should be happy. Georgia
Tech squeaked through 31 to 30.
AMERICA Looks like there's some pretty good
football games coming up this weekend, too.
CAPCOM That's right, in the pros.
AMERICA Houston, America.
CAPCOM Go ahead.
AMERICA Gordy, we'd like to go back to AUTO on
the glycol evap temp. You concur?
CAPCOM That's fine with ECOMM. Your choice.
AMERICA Okay, we're just going to back to auto
on the switches.
CAPCOM Okay.
AMERICA And we also would like to take that
inverter off. It's getting a little warm in here now and
this PTC ought to be pretty comfortable tonight.
CAPCOM Okay.
AMERICA Okay, we'll take inverter number 3 off.
And I think the power's off also.
CAPCOM Okay.
PAO This is Apollo Control at 290 hours
34 minutes. We expect to be putting the crew to bed shortly
as soon as they finish up some last minute items. Their
sleep period was scheduled to begin about 30 minutes ago.
And, at the present time, Apollo 17 is 75 300 nautical miles
from Earth traveling at a speed of 6364 feet per second.
During the sleep period, the flight dynamics officer and
return to Earth officer, or RETRO, will be compiling addi-
tional tracking data on the spacecraft and making final
computations for a midcourse correction. The last opportu-
nity for midcourse correction comes about 3 hours prior to
entry interface, designated midcourse correction 7. Right
now, it looks like that maneuver would require no more than
about 2 feet per second velocity change. This is
for Corridor Control to get the flight path angle of the
entry very close to the desired 6 and a half degrees below
the horizontal. That flight path angle at the present time
is quite close to the desired angle. We're in the process
of a shift handover at this time in Mission Control. Flight
director Pete Frank will be the oncoming flight director and
the spacecraft communicator, CAPCOM, will be astronaut Bob
Parker. There will be no change of shift press briefing.
This is Apollo Control at 290 hours 36 minutes.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/18/72 GET 290:37 CST 2330 MC-1041/1

AMERICA Houston, America.
CAPCOM Alright, go ahead.
AMERICA We bid you hello, Bob, and at the same
time, goodnight.
CAPCOM What can I say? I'm cryin'.
AMERICA Well, we thought we'd give you about 8
hours to think about it.
CAPCOM That's about all I've got to do.
AMERICA See you in the morning, babe.
CAPCOM Roger.
PAO This is Apollo Control. The downlink
voice subcarrier has been turned off in the spacecraft
indicating the crew is ready for sleep. Apollo 17 is
73 290 nautical miles from Earth. Velocity has increased
to 6488 feet per second. We'll take this release lying
down now and come back with hourly status reports. At
291 hours 8 minutes this is Mission Control Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/19/72 00:45CST 291:52GET MC1042/1

PAO This is Apollo Control at 291 hours
52 minutes. Apollo 17 now 70 530 nautical miles from Earth,
velocity 6659 feet per second. Crew is asleep with a little
over six hours remaining in the rest period. All spacecraft
systems performing normally. At 291 hours 52 minutes, this
is Mission Control, Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/18/72 GET 293:52 CST 0245 MC-1044/1

PAO This is Apollo Control. All is still going well aboard Apollo 17 which is now 62 609 nautical miles from Earth, traveling at a speed of 7200 feet per second. 4 hours 7 minutes remaining in the crew rest period and 10 hours 26 minutes away from entry into the Earth's atmosphere. At 293 hours 52 minutes this is Mission Control Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/19/72 CST 04:45 GET 295:52 MC-1046/1

PAO This is Apollo Control. Everything is still going well on Apollo 17, 2 hours 7 minutes remaining in the rest period. Spacecraft America is 54 008 nautical miles from Earth. Velocity 7895 feet per second. America is 8 hours 26 minutes from entry into the Earth's atmosphere at time velocity will have reached more than 36 000 feet per second. At 295 hours 52 minutes this is Mission Control, Houston.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/19/72 CST 05:45 GET 296:52 MC1047/1

PAO This is Apollo Control at 296 hours 52 minutes. Apollo 17 is now 49 415 nautical miles from Earth and velocity has increased to 8328 feet per second. The crew has 1 hour 7 minutes left in this rest period. Systems performance on the spacecraft remains good. Apollo 17 is 7 hours 26 minutes from entry into the Earth's atmosphere. At 296 hours 52 minutes this is Mission Control, Houston.

END OF TAPE

PAO This is Apollo Control at 297 hours 58 minutes, 2 minutes away from crew wakeup. The spaceflight meteorology group of the National Weather Service said this morning that weather conditions are expected to be satisfactory for the landing and recovery of the Apollo 17 crew and spacecraft. The weather forecast for the planned landing area, approximately 360 nautical miles southeast of Pango Pango, calls for partly cloudy skies, easterly winds of 10 miles per hour, seas of 3 feet and a temperature of near 77 degrees. Apollo 17 now 43 991 nautical miles from Earth. Velocity 8908 feet per second and we're 6 hours 19 minutes away from entry into the Earth's atmosphere. We've got about a minute to the wakeup call, we'll stand by for that.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/19/72 CST 06:52 GET 297:59 MC1049/1

CAPCOM (Music - Anchors Away and The National Anthem).

PAO This is Apollo Control, we suspect that none of the crew has a headset on.

PAO This is Apollo Control, both Ron Evans and Jack Schmitt are plugged into the biomedical sensors, but the data we get indicates they're both still asleep.

CAPCOM (Music - Anchors Away)

PAO The crew is awake.

CAPCOM (Music - National Anthem).

SC Hey, Houston, this is America, that's mighty fine.

CAPCOM Roger, America, it's Houston, we're ready to have you come home today.

SC Hey, mighty fine, We're all set too.

CAPCOM Okay, might read you a page - go ahead.

END OF TAPE

SC Hey, mighty fine. We're all set too.
CAPCOM Okay, I might read you a page -
SC (Garble)
CAPCOM Go ahead.
SC Okay, we've been waiting a long time for
Anchor's Aweigh. And we've missed it. (laughter) -
CAPCOM I imagine -
SC You want to play it again.
CAPCOM I imagine you'll hear it a couple of more
times today too.
SC Oh, okay, but if we could hear it again
that'd be great.
CAPCOM It'll take them a while to cue it up and
maybe we'll work on that. Let me give you guys a few items
here while you're thinking. Number one, the old weather report.
2000 scattered, high scattered, 10 miles visibility, 3 foot
seas, and the winds are out of the east at 10 knots. Just
about exactly what you had yesterday and probably what we've
been telling you for 2 or 3 days. Looks like we're going to
have a midcourse 7 this morning about 2 feet per second. Pretty
much just to really center us in the corridor. We're already
within the corridor now with no problems. We're going to exit
PTC at the different roll angle. We'll read that up to you later
when you get the flight plan out, but just so you don't go
ahead and exit early we will be sending you something up on
that exit PTC to new roll angle and as far as the levers are
concerned you guys have been looking for a place to stow those
last night and what we're suggesting is putting them in the
sleeper strain on top of A8 where you got one suit stowed
apparently. And we're suggesting you put one of those on the
helmet on that PGA. And the other one if were loose is in the
bag. Over.
SC Houston, America. We've got the PGA's in
the bag. (Laughter) Hope that's right.
CAPCOM You got all three of them in the L-shaped
bags or have you got - the understanding down here apparently
in talking last night was that one was in the sleeper strain
on top of A8, in a sleeper strain bag.
SC Well, we've got CMP and LMP suits at the
bottom. I'll leave the commander and LMP suits at the bottom
part of it. CMP suit's in the top of it - in the
top of the L-shaped bag.
CAPCOM Okay, we'll work on that and we've got
something else for you here in just a minute.
Music from "Anchors Aweigh"
SC Thank you, Robert. Most appreciative.
CAPCOM Okay, we aim to please. That's also, I
might tell you guys, the third time we've played that this
morning, although you only heard it twice. We played it once

APOLLO 17 MISSION COMMENTARY 12/19/72 GET 298:11 CST 0705 MC-1050/2

CAPCOM before we sent the crew alert.

SC CMP has no comment.

CAPCOM Okay, America, we'd like to request the medium on high gain antenna, please.

SC Okay, you have REACQ at Medium.

CAPCOM Okay, and I guess now on the levers what we're suggesting is you put down - put the two of them in by themselves in a sleep restraint and tie it down on top of A8. And I've got a lot of fancy words on how to tie it down on top of A8 if you guys can't figure out how to do it. I can read it off to you or we can leave it to your intuitive good sense.

SC Well so far we've been pretty much with most of your recommendations around here, I think we could probably hack that one too.

CAPCOM Roger.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/19/72 CST 07:18 GET 298:25 MC-1051

PAO This is Apollo Control at 298 hours
45 minutes. The crew's having breakfast now. Apollo 17
39 979 nautical miles from Earth. Velocity 9401 feet per
second. We're 5 hours 33 minutes from entry into the
Earth's atmosphere.

SC Houston, America.

CAPCOM Go ahead, America.

SC We're looking at your big smiling crescent
how far out are we?

CAPCOM Stand by. You're just about to cross
the 40 000 mile line here at the MOCR.

SC 40 000 miles. Okay.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/19/72 07:58 CST 299:01 GET MC1052/1

SC Houston, America.
CAPCOM Go ahead, America.
SC Okay. Good morning Robert. I've
got the (garble) valve temps for you.
CAPCOM Roger, we're ready to copy.
SC 5 Charlie 3.95; 5 Delta 4.4; 6 ALPHA
4.15; 6 Bravo 4.05; 6 Charlie 4.3; 6 Delta 4.2.
CAPCOM Okay, Ron. And those sounded good.
SC Okay.
SC Got that now.
SC Houston, America with the food and
medical report.
CAPCOM Stand by on that Ron. We've got an
antenna switch coming up. As soon as we get you back on
COMM we'll go ahead with it.
SC Okay.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/19/72 08:21 CST 299:28 GET MC1053/2

CAPCOM And America, Houston. The high-gain
angles to go at that roll angle of 306. High-gain angles
are pitch 34 yaw 267. Over.

SC Roger, 34 and 267.

CAPCOM And America, Houston. I've got a
couple of other items of these flight plan updates if you're
ready to copy them.

SC Go ahead, Bob.

CAPCOM Okay, at 301:50 - 301:50 add UV cover
closed.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/19/72 CST 08:30 GET 299:38 MC-1054/1

SC Okay, got it.
CAPCOM Okay, and then on the other page there
at 302:06, delete the line, UV cover close.
SC Okay.
CAPCOM The next change here, is to the entry
checklist and to the entry cue card.
SC Okay, go ahead.
CAPCOM On the entry checklist, page 1-3 between
steps 23 and 24, it's actually part of step 23. S-Band
OMNI antenna, Charlie, change that to Delta. On the S-Band
OMNI antenna, Delta.
SC Okay, we've got Delta. At horizon check attitude.
CAPCOM Roger, and if you'll go over to 2-4,
entry checklist where it says Yaw back to 0 degrees after
SEP, we would like you to insert, select OMNI Charlie. OMNI
Charlie, at that time.
CAPCOM And that will be also required on your
entry cue card at 45 minutes where it says Yaw to 0, you'll
have to be OMNI Charlie, select OMNI Charlie.
SC Okay, we've got it covered everywhere.
CAPCOM Okay, and the reason for that, is for
better coverage going through Hawaii and that and then OMNI
Charlie is coming back up on the ARIA.
SC Okay, Bob.
CAPCOM And, America, Houston. Just one word
to the CMP. If you have a chance. One of your EKG sensors
seem to be loose, if you can tighten it up a little bit.
SC Okay, I'll try pressing on it.
CAPCOM America, Houston. You're getting pretty
close to your 306 Roll.
SC We'll watch in here, Bob. Now 20 -
CAPCOM Okay, real fine.
CAPCOM We'd like auto in the high gain.
SC Okay.
CAPCOM America, Houston. We'd like ACCEPT, we've
got your entry REFSMMAT.
SC Okay. You have ACCEPT. Okay, Houston, IR
is coming open.
Okay, we copy the IR, and the cover's coming open.
CAPCOM Affirmative.
SC Okay, Bob. Spacecraft is configured in
SCS as per the flight plan up through the P-52.
CAPCOM Roger.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/19/72 08:41CST 299:48GET 1055/1

CAPCOM America Houston, the computer is yours.
SC Roger, we're with the block.
PAO This is Apollo Control at 299 hours, 54 minutes
ground elapsed time. Four minutes - four hours, 23 minutes away
from entry into the atmosphere. An hour and 22 minutes until -
SC I think I'll stay DSKY.
CAPCOM Roger, Ron, we've got you NOUN 05.
SC Okay.
PAO One hour, 22 minutes until ignition on midcourse
burn number 7 which will be a two jett RCS maneuver.
SC Okay, we'll torque at 55:45.
PAO Midcourse 7 is now standing at about 2.1 feet
per second. The spacecraft presently is 33,435 nautical miles out
from earth. Velocity continuing to build up 10 359 feet per second
which will grow to 36 000 feet per second at the time the spacecraft
enters the Earth's atmosphere at approximately 85 miles altitude.
At 299 56 up live on the air to ground circuit through entry and
splashdown. This is Apollo Control.
CAPCOM Ron, while you're doing your maneuvering no need
to answer but just a reminder due to the - stopping your roll angle
differently you're under the EI REFSMMAT attitude your roll will be
about 046 and you'll see a max yaw of about 64 degrees during this
gyro torquing.
Ah ha, Oh, okay, s for calling.
SC It sounded like yesterday you might have had a
cold and it sounds like it might be a little worse today.
CAPCOM Naw, no, feeling great.
SC Okay, mighty fine.
CAPCOM That's my get serious and get you home voice,
see?
SC Okay, perfect.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/19/72 GET 299:59 CST 0852 MC-1056/1

SC Okay, Houston, this is the coarse align torquing angles, we're torquing 08:45.

CAPCOM Ah, stand - Okay, go ahead. That's fine.

SC You want me to read them down to you?

CAPCOM No, that's all right, we didn't need them.

SC Okay, I didn't think so.

CAPCOM And just for your information, I might pass along the drift checks on the platform have been extremely good and the platform is in real good condition. I'm sure you're -

SC Hey, mighty fine. What kind of values - average values have you been coming up with now (garble) lunar orbit, but I know if they have come back since then.

CAPCOM You're down like .005 degrees per hour, down in the thousandths of degrees per hour.

SC (Laughter) That's not bad at all, is it?

CAPCOM No, you could take it right back to the Moon if you wanted to, my golly.

SC Yes, sure could.

SC Okay, Bob, GDC is aligned and we are in CMC.

CAPCOM Roger.

CAPCOM America, Houston, if you'll give us ACCEPT we'll give you an MCC 7 target load, a target vector, and an entry vector.

SC Okay, you have ACCEPT.

CAPCOM And America, we've got the MCC 7 and the entry pad's for you whenever you're ready to copy.

SC Okay, standby 1. And you might be interested to know we have had no problems whatsoever locking the YY strut on this flight.

CAPCOM Good show. We copy that.

SC Okay, Bob, ready for midcourse 7.

CAPCOM Roger, midcourse 7. RCS/G&N: 26686. NOUN 48's are not applicable. 301:18:00. 34, plus 00021, plus all zeros, minus 00001, 000 130 000. HA is not applicable. Plus 00229, 00021, 009, 00021. Sextant star is 31, 3299, 348. Rest of the PAD is not applicable. Set stars: Sirius and Rigel, 273, 256, 347. One note we would like 2 jet plus X RCS using quads Bravo and Delta. I'll say again, 2 jet plus X RCS quads Bravo and Delta. Another note, high gain angles, pitch minus 83, yaw 244, over.

CAPCOM And America, the computer's yours.

SC Okay, going block. Okay, Bob, here's your readback. It's a midcourse 7 RCS/G&N 26686. NOUN 48 is N/A 301:18:00.34 plus 00021, plus all zeros, minus 00001, 000, 130, 000. HA is N/A, plus 00229, 00021, 009, 00021 31 3299 348. Rest of the PAD is N/A. Sirius and Rigel, 273, 256, and 347. Ullage is 2 jets plus X and RCS quads B and D. That's Bravo and Delta. High gain, the pitch minus 83, and the yaw is 244. Over.

APOLLO 17 MISSION COMMENTARY 12/19/72 GET 299:59 CST 0852 MC-1056/2

CAPCOM Roger, Jack, good readback except it's not ullage, it's just your 2 jet burn.

SC Well, okay, 2 jet burn then.

CAPCOM And Jack, we have the entry PAD standing by for your call.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/19/72 09:10CST 300:17GET 1057/1

SC Okay, Houston. We're ready to copy.

CAPCOM Okay, it's into the mid pack area. 000 153 000, 304 01 37 268. NOUN 61's minus 1788 minus 16613 064 360 90 649 104 49 36172 304 18 37 0029. NOUN 69 is not applicable. D zero 400 02 09 0017 0337 0739. Sextant star is 13 117 3 155. Borsight star is not applicable. Lift vector is up. I've got six comments. You can take those now or we can get the readback and then go through the comments.

SC Go ahead on the comments and take them a little slower than usual, Bob.

CAPCOM Okay. Comment number 1, use non-exit EMS pattern. Comment number 2, RET 90K 06 01. RET MAINS 08 26. RET landing 13 17. Constant G is roll RIGHT. And the last comment GET Moonset 304 16 14. Over.

SC Okay, Roberto, that's midpack 000 153 000, 304 01 37 268, minus 1788, minus 16613, 064 360 90, 649 104 49, 36172, 304 18 37, 0029. NOUN 69 is NA. 400 02 09, 0017 0337, 0739. 13 117 3 155, Boresight star is NA. Lift vector is up. Comments, 1, use non-exit EMS pattern, 2, RET 90K is 06 01. RET MAIN 08 26. RET landing 13 17. Comment 3, constant G roll RIGHT. Four is GET Moonset 304 16 14. Over.

CAPCOM Roger, Jack, good - readback. That should be the last of the pads.

SC Okay sir, give my hand a rest.

SC Okay, Houston, change the DAP for PD on the 2 jett plus X.

CAPCOM Okay, we're watching.

SC GARBLE. Yeah.

SC They're are none.

SC Hello Houston, this is America.

CAPCOM Go ahead.

SC Okay, Bob, looks like CDR has - there's no bio-med electrolyte sponges in the spacecraft either in the LM kit we brought back or in the command module kit. So it looks like I'll be going in without biomed.

CAPCOM Roger, Gene.

SC Hope you can make it, Geno, without that.

SC (Laughter)

END OF TAPE

SC Okay. (garble).
SC (garble) that's normal. Well, there's the commander's alarm, that's good. Okay, plus 329.90 plus 34.800, and we start 31. And, Houston. We've got minus 29.2 on the Delta V test pumps on the EMS.
CAPCOM Roger. We copy that, Ron.
SC And star Sextant, checks good, there Houston.
CAPCOM Roger.
SC Okay, ask for a dump now.
SC (Laughter). Testing - accelerating my EMS pump.
SC Well, I'll be darned. And Houston, you've got an entry at Bobo on the null Bias check. EMS is counting like a sun of a gun. (Laughter.) Almost as fast as the Delta V test, but not quite.
CAPCOM Roger. And you're really smoking along aren't you.
SC (Laughter) Yeah. No, I wouldn't think that it would accept that, but -
CAPCOM Right.
SC Anyhow we'll use burn time and - 985 for the - to burn.
CAPCOM Roger.
CAPCOM Ron, you're happy with your EMS Null Bias check, aren't you?
SC Negative, none, there's no Bias check, no. I'll give you count in a minute. We'll review the EMS Delta V test and then go back and try another Null Bias check. But, it looks like we're count from about 100 to 75 in 30 seconds. Let me check that out.
SC It's okay, at that Delta V test, and that time we got a bias 20.3.
SC Okay, Houston. They started at minus 100 on the Null Bias check. 30 seconds at 118.8. 1-minute 137.8.
CAPCOM Ron, would you verify those are negative numbers?
SC That's affirmative they're negative. Okay, a minute and 40 seconds minus 163.7 or so. Okay, Houston. we've got a little bit of time here and looks like we've still got 3 EMS tests left, I'd like to go ahead and do another EMS Test on that and we'll see if that integratør is all fouled up completely. I'll be with you in a minute.
CAPCOM Okay, Ron. We agree.
SC Okay.
SC Okay, test 1 looks all right. And test 2 is okay, (garble). Okay, going to test 3. 10 seconds MARK it upper light came on. Okay, a 58.0 in the range counter. MARK it. Okay, it's going down, going across. MARK it. Ah, ha. Okay. G line comes across at 9g (Laughter) and range indicator, indicates 0.0. Outstanding.

END OF TAPE

SC And test 5 looks on.
SC Okay.
SC Zero's right. P41 here. Watch it,
Jack, now. 39 130 and 359. Now about 25 minutes from
firing. 25.
SC Think you can get those things done
by that time?
SC Okay, just (garble). Gosh, let's go
ahead and trim it. Okay, we are trimmed. That don't
hurt. NOUN 20 - 24 minutes to burn.
SC Houston, America. Does it look like
we're going to hack it on the waste water tank there?
Tank 2.
CAPCOM Ron, yes we're not going to dump the
waste water tank at this time and we won't dump it after
midcourse 7, of course.
SC Okay. Just what I like to hear.
SC Bat C up around 36.5. Pyros - 36.9 -
36.9. Okay. Fuel cells are looking good too. AC is looking
good. It's 18 minutes yet.
CAPCOM America, Houston.
SC America, go ahead.
CAPCOM Oh Ron, we've been checking around the
CMS tests and the null Bias tests and we concur on this
burn using NOUN 85's in your burn time as your ques and
not using the EMS. We would like, however, for you to bias
the EMS. Set in a plus 118.8 at - and it will go to normal
at Tig minus 30 seconds and we'd just be interested in what
the EMS does under a very small G field like this.
SC Okay. We'll set in at plus 118.8 and
turn it to normal at Tig minus 30 seconds and I'll try to look
at it at the end of burn time. Or go to stand by at that
point in time so we can make it a good hack on it.
CAPCOM Rog. That'd great, Ron, and
we see no problem for entry with the EMS.
SC Rog. Mighty fine.
SC We've really got the Christmas spirit
out the window here. Looks like it's really snowing.
CAPCOM Roger. Glad it's not snowing on us
with that stuff.
SC (laughter). Oh, it's frozen.

END OF TAPE

SC Okay, Gene, let me read through the P41 here just to make sure we got everything. Okay, we're in the same basic configuration I guess. The IR's ON and it won't hurt (garble) anything. (Garble) on but at this point in time it won't make any difference, I guess. CMC is on, ISS is on, SCS is operating, we tested the caution and warning, the Delta V test works, both bias pumps and Delta VC, we'll set that up. Okay we got one more 11.8 and Delta V in standby. B mags are caged and Rate 2. Okay Auto RCS selects, we'll put those on for trim. Position of trim - X axis only. Okay, I'll leave BD off. I got the DAP VERB 4 NOUN 46, enter , CSM don't use AC use BD for plus X. Narrow deadband half a degree per second. Use BD for roll, okay. Okay, mode controller, HC's are off. Directs are on. 13 minutes. Okay, I got the DET set. I'm checking degrees. And we're in CMC and AUTO. We're in the burn attitude then boresight sextant star check for P41 and maneuvered to right attitude. And we're still in Rate 2. Okay, Auto, okay, I think I'm going to realign them on the old GDC. Okay, the old GDC is aligned - let's see, (garble) answer in rate command. The min deadband rate to low. Limit cycle is off. Att one. Rate 2. Okay, standby for 5 minutes and we're 10 minutes from burn, Gene. And Jack, burn time is 9 seconds. Nine seconds. And we'll trim X only to 2/10's of a foot per second. Houston, America, does this kind of change our entry angle about 2/10's? 2/10's of a degree?

CAPCOM 2/10's of a degree, Ron.

SC Oh, okay. Which way is it best, keep it under or shallow it up?

CAPCOM It'll make you a little more shallow. Very little shallow -

SC Oh, okay. Okay.

CAPCOM Ron, it's going to run you from 6.7 entry angle to a 6.49.

SC Oh, okay. Yeah, that's what I thought, okay.

SC Eight minutes to go.

SC Okay.

SC Next time we do this we'll have to allow a little more time for the dumping prior to the burns.

CAPCOM America, Houston. You're GO for MCC-7.

SC Roger, we're GO for midcourse number 7.

END OF TAPE

SC Are they supposed to go the other way.
SC I guess they're all going in different directions - it just looks like they're loping by window 1 here.
CAPCOM Go ahead.
PAO This is Apollo Control at 301 hours 14 minutes ground elapsed time, 3 minutes 48 seconds away from midcourse 7 maneuver. Distance currently 25,408 nautical miles. Velocity 11,928 feet per second. Three minutes, 20 seconds mark to midcourse 7, 2.1 feet per second, 2 jet RCS maneuver.
SC Advance control power is on. Check that little arm. That ought to do it. Okay, we have trim check the GARBLE down there.
SC Okay, Houston, America, we're coming up on 10 minutes and we're ready for MCC-7.
CAPCOM Roger, America, you're looking good.
SC I'm working on GARBLE. That's right on. That's right, it should go on automatically within 30 seconds - okay.
SC I wonder what we've got now. Okay.
SC Okay, 30 seconds and we'll EMS to normal.
SC GARBLE here we go, 30 seconds. Be up to normal.
SC Okay.
SC GARBLE. 10 seconds to go, Jack, 2, 1, MARK
it.
SC We're burning Houston.
CAPCOM Roger.
SC Okay, got it. And I stopped it right at nine seconds. There's your data 85.
CAPCOM We're looking at them.
SC Okay, EMS is 100.1. Okay, test control power is off. Direct's are OFF, flight controllers are safed.
SC Houston, it looks like the burn was right on the money. You saw the residuals and burn - was a 9 second burn on time.
CAPCOM Roger, America, it looked good.
SC And the REV 66 is it.
CAPCOM Roger.
SC Ah-ha, I get to get out of my g-suit. Oh, while I think about it Houston, I've noticed it throughout the flight here, in the simulator CMC control will allow your rates - you know to bounce back and forth - maybe up to - oh, sometimes a tenth burn likely at .05 degrees per second, as it trims to within the dead band. In 4 jet translations- as well as in 2 jett translations your rates get up to about almost 4/10 of a degree per second as in damping within it's own dead band there.
CAPCOM Roger, Ron.
SC Ron, okay. That's okay.
CAPCOM America, Houston, just to make doubly sure that we don't get any venting from the waste tank we would like on panel 352 the waste water relief valve to OFF, please.
SC Okay, we'll get that.

APOLLO 17 MISSION COMMENTARY 12/19/72 10:06CST 301:13GET 1061/2

SC
that correct?

CAPCOM

SC

Battery net, presumably will stay open, is

Standby on that Ron. That's affirmative, Ron.

Okay, we'll leave the batteries in open.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/19/72 CST 10:14 GET 301:21 MC-1062/1

SC
valve is in OFF.

CAPCOM
CAPCOM
the high-gain.

SC
CAPCOM

Okay, Houston. The dump pressure relief

Roger.

And, America, Houston. We'd like wide on

Okay, the high-gain is on wide and auto.
Roger.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/19/72 10:27 CST 301:34 GET MC1063/1

PAO This is Apollo Control at 301 hours 38 minutes ground elapsed time. 2 hours 39 minutes away from entry into the atmosphere for Apollo 17. Velocity now 12 611 feet per second. This velocity will triple by the time they reach the atmosphere. Current predicted velocity at atmospheric entry 36 090 feet per second at an angle of minus 6.5 degrees. Command Module Pilot, Ron Evans, at the present time, is donning the so called counter-pressure garment which is being evaluated for possible future space programs as a protection against cardiovascular changes that occur to the human body after long missions. The midcourse correction burn number 7 went off on time very nominally. Little over 9 seconds burn time with two RCS jets. A change in velocity of 2.1 feet per second. In the landing area in the South Pacific the National Weather Service said, this morning, that weather conditions are expected to be satisfactory. Weather forecast for the planned landing area - 360 nautical miles southeast of Pago Pago is for partly cloudy skies, easterly winds at 10 miles, seas at 3 feet, and a temperature of near 77 degrees. 2 hours 38 minutes away from entry and at 301:40 ground elapsed time in the mission of Apollo 17, this is Apollo Control.

CAPCOM America, Houston.

SC Go ahead.

CAPCOM Jack, we're just more or less trying to fill up our data book down here and if you haven't already done one, we'd like, in a free time, if Ron would run another Null Bias Check just to see if the drift changed when we did that little bitty burn.

SC Okay, I'll mention that to him.

END OF TAPE

APOLLO 17 MISSION COMMENTARY, 12/19/72 10:35CST 301:42GET 1064/1

SC Houston, 17.
CAPCOM Go ahead, America.
SC Yeah, Bob, this is Jack, did you have any problem reading me with this count configuration I got on now.
CAPCOM No, we're reading you loud and clear. If I was a little late on that it was because I've got some problems down here on my console that's all. The whole room yelled at me that you'd called.
SC No, no that's no problem. I just hadn't made a check with you and I just wanted to make sure I was readable.
SC Okay, Houston, this is America command module pilot on the LMP's GARBLE, how do you read?
CAPCOM Read you loud and clear, Ron.
SC Okay, good. I understand you want a Null Bias Check again.
CAPCOM Yeah, we're just wondering if maybe the - if maybe it was an air bubble or something in there - in the small g field of that midcourse 7 burn might have changed something just like to take a look at it.
SC Okay, we'll take a look at it. Okay, 30 seconds 94.0, starting at plus 100 that time for some reason. One minute, 87.8. Okay, it was 79.0 at a minute and 40 seconds.
CAPCOM Okay, Ron, we got that.
SC Do you want to try the minus 100 part of it, or do you think it's worth it.
CAPCOM Well, Ron we'd like it - it's just that data gathering point that's all - you know that's G&N entry.
SC Okay, we'll start. The other guys are crawling around down under the couches - they're trying to get the stuff locked in there, anyhow. I think I must have shrank, my shoes went on easier now than they did on the fitting. I must have shrunk, I guess is the correct terminology. Shrank, shrank?
CAPCOM Whatever you like.
SC (Laughter).

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/19/72 10:44 CST 301:51 GET MC1065/1

SC T minus 105.8 at 30 seconds. Minus
115.7 - I mean 111 - 111.7 at one minute. And it's minus
119.1 or 2 - about 2 - about 119.2 at a minute and forty.

CAPCOM Okay, Ron. It's very consistent data
both ways after the burn. It doesn't tie up with the
data prior to the burn too well.

SC Ah ha.

SC Houston, UV cover is closed and talk back's
great.

CAPCOM Roger.

CAPCOM Ron, we're going to break lock here
in a minute. We've got a sight handover.

SC Okay, I'm set.

SC Hello Houston. How do you read CDR?

CAPCOM Read you loud and clear, Gene.

SC Okay, Bob. I'm back up now and I'll
stay with you.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/19/72 11:00CST 302:07GET 1066/1

SC Okay, IR can come off. And EV OFF. IR cover CLOSED. S-band OFF, TV OFF. And data system OFF. Through with the old flight plan, let's check and see if we've got those other two items, of course, I think we do. Yeah, there was one.

CAPCOM Okay, Ron we'd like to make sure that the logic power on 181 is off center.

SC Okay, standby one. Yeah. Yeah, they're in deployment which I just put to OFF. Okay, deploy MAIN A, MAIN B are both off center.

CAPCOM Okay, Ron. Thank you. And it's sad to shut off the SIM bay it's operated so tremendously in this mission.

SC SIM bay has been outstanding.

SC Okay, Houston. We're coming up on 2 hours here. How about the logic sequence check?

CAPCOM We're standing by.

SC Okay, SECS logic - two of them are closed, SECS arm, two are closed, ELS, CSM SEP batt A, batt B are CLOSED. Okay, ELS, logic is ON, ELS AUTO is ON. Okay, Houston you all set for the SECS logic?

CAPCOM That's affirmative.

SC Okay, number 1 is ON. SECS logic number 2 is ON.

CAPCOM America, we're go for pyro arm.

SC Okay, it sounds good. We'll go pyro arm. Okay, SECS logic number 2's coming OFF, SECS logic number 1 is OFF. Arm - BATT B is OPEN, arm BATT A is OPEN. EMF logic is OFF. ELS is to MANUAL. Okay, the old SEP breakers are OPEN.

CAPCOM Roger, good show, Ron.

SC Okay, we've got her.

SC Hello, Houston. This is America. We are stowed for reentry.

CAPCOM Roger.

SC And, Bob, as a note of interest the spacecraft is dry. Both the forward hatch, the tunnel and the tunnel hatch.

CAPCOM Roger, we got that.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/19/72 GET 302:23 CST 1116 MC-1067/1

SC
whip into P52 here.

CAPCOM

SC
a sliver -

Okay, Houston, this is America, we'll

Roger, we're watching it.

There goes the Earth. Hey, it's just

END OF TAPE

SC There goes the Earth, man it was just
a sliver.

SC Houston, you'd be happy to know, that the
Moon now, has finally got back to its normal size for us.

CAPCOM Roger.

SC Well looks like 5 balls, but that's not
bad for reentry, I guess. You know, I never noticed it before,
but looking next to the earth, right now, and of course, that
makes it a kind of bluish reflection inside the ah - the
sextant, and you can't see the reticle brightness at all.
It just, you know, it just comes through the black - black
line in there. And there are two lines you know, I've got
2 - one of them must be, - there are 2 reticles, no, there
are 2 reticles, one's in focus but the other one isn't.

CAPCOM Roger. Ron. We can except the NOUN
05.

SC Okay. (Laughter) There we go, there's
NOUN 93's.

CAPCOM Then you can torque those, Ron.

SC Okay, we're torquing at 45 - 42:15.

SC Okay, Houston. We're going to maneuver
to the horizon check attitude now.

CAPCOM Roger, Ron.

SC Houston, America. I'll go OMNI DELTA
now.

CAPCOM Roger. We concur.

SC Got the commander's alarm.

CAPCOM Roger. Copy.

SC Houston, America. The horizon star-check
is GO.

CAPCOM Roger. Good word.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/19/72 GET 302:50 CST 1143 MC-1069/1

PAO This is Apollo Control. Apollo 17 now 12 381 nautical miles out from Earth. Velocity now 16 571 feet per second, still and hour and 18 minutes away from the atmosphere. Following the crew as they continue down through their through their pre-entry check lists, the SIM bay experiments and data system has been - have been turned off. The crew is at this time going through all of the checklist shown in the flight plan for getting the spacecraft ready for entry. Continue to stay up live all the way through first blackout if possible, which will be through the Hawaii tracking station. From then on the Apollo range instrumented aircraft will relay voice and we'll probably lose data at that time as soon as Hawaii loses acquisition of the spacecraft. All of the aircraft and recovery vessels are either on station or approaching their assigned station in the south central Pacific. At 303:01 ground elapsed time, standing by, this is Apollo Control.

SC Okay, EMS function is off and two of them are closed. EMS circuit breakers are closed. EMS is at standby. Test one. Okay, and wait 5 seconds. Okay, it's 10 seconds. Let's do it and get it right. This one. Ah, that always comes on on test 1, I don't know. 5 G light always comes on on test 1. Okay? And still got two of them left. Let's try number 2, I guess. Never pass up a gas station, if you really need it. Okay, test 2. Okay, it's out. Okay? There we go. Mark it. Mark it. Okay, 10 second timer works. Always comes off. Okay, that's a (garble). Get rid of it. Okay, here we go. There goes zip. Tests are going down. Stops at 9G, it's going across and counting down. Mark it. Okay, it stopped at 0.0. It stopped right at the old black line there. That's good. Okay, .05G light (garble). Okay, and 10 seconds later or so, and here we go. Yep, it's going on. It stopped at .2. It varies 10 seconds and then the light came on. Okay, let's see, we go to 37 K. Hey, Houston, let me double check on this. The old .05G light was on in EMS test 1 when I went to Normal. Seems to me like that's normal but it may not be. Could we check on that for sure.

CAPCOM Okay, we're checking on that.

END OF TAPE

SC Good enough. Press on with the activation.

SC Houston, we're pressing on with the primary water valve activation at this time.

CAPCOM Stand by one. It's affirmative to Ron that he can press on the EMS test.

SC Okay, thank you much.

CAPCOM And to Gene on those water boilers, that's affirmative.

SC Okay, fine.

SC Okay, non exit pattern. That's what we want. See the line's on 37K. Okay, we're going to range set - flick - and there it goes up to the top. Okay, and the range's set and we'll stand by now.

SC Houston, we're going to activate the secondary.

CAPCOM You are GO on the secondary.

SC Okay.

CAPCOM Okay, Ron, as you're going through the test, just a word on that EMS test 1. It is not normal for the zero 05G light to be ON in entry test mode 1. It is probably a result of that drifting accelerometer. It's - we'll have to just wait and see what the rest of the test looks like.

SC Okay, the rest of the test is GO.

CAPCOM Okay.

CAPCOM Again, it's probably a result of that drifting accelerometer and possibly under the high G load of entry it will be no problem at all. It's all probably in the - drifting in the - in the mud.

SC Okay.

SC Mighty fine.

CAPCOM And America, if you can give us ACCEPT we've got a vector for you.

SC Okay, you have ACCEPT.

SC Okay, Houston, both evaporators are up.

SC Ullages.

SC Hello Houston, on the preheat we've got 5 Charlie at 38.

CAPCOM We copy that. And we've got Delta.

SC And we've got 6. Okay, and we've got 6 Bravo at 385.

CAPCOM America, the computer is yours.

SC Okay, we're going to BLOCK.

APOLLO 17 MISSION COMMENTARY 12/19/72 12:00 CST 303:07 GET MC1070/2

CAPCOM America, Houston. We looked through
the Cal Curve and we recommend no preheat on the RCS.

SC Roger, Houston. I understand. No
RCS preheat - commence with RCS preheat.

CAPCOM That's affirmative.

CAPCOM America, Houston. Somebody is standing
by on the VHF. We'd like to get the VHF voice check out
of the way if it's possible.

SC Okay, go ahead.

CAPCOM Stand by. We'll reconfigure here.

END OF TAPE

CAPCOM America, Houston. We'd like to verify that the left antenna is selected and that we are in VHF simplex ALFA.

CAPCOM America Houston. America, Houston.
SC Houston, this is America, go ahead on that bet.

CAPCOM Roger. Did you get my last call, that we'd like to verify in left antenna and in simplex ALFA, and we'll give you VHF check here shortly.

SC Affirmative. Maybe that was feed-through we were on, Jack was on VHF, called you back on VHF, must have been S-band feed through, though. But verified we're on antenna left and VHF simplex ALFA.

CAPCOM Roger, Ron. And ah we are going up (garble) I understand Jack is reading us on the VHF.

SC Yeah, that's affirm. He was retransmitting on VHF, evidently you were reading our VHF.

CAPCOM Roger. It's normal to have VHF uplink prior to receiving VHF downlink. We're satisfied here.

SC Okay. Mighty fine.

CAPCOM And Ron, just for a verification, we will make another VHF check when you get a little closer, so we can get a downlink signal on you.

SC Oh, okay real well.

SC Hello, Houston. We have a GO on the PYRO Bats, they're both 37, we're picking the checklist up on the top of 1-6.

CAPCOM Roger. We understand.

SC Okay, I'm panel 8. Okay, direct auto open command module heaters are open, okay, docking probe are open, Whoops, stand by, stand by, let's close the RCS logic buss. RCS logic Main A, main B going closed. Okay, docking probes are open, SPS pitch and yaw are open 2 more, at least 4 of them open, 3-flip lights are open, and SECS ARM are open, EDS batts are open, ELS/CSM SEPs are open, post landing vent is open. Okay, all the others are closed.

SC Rog, seems pretty good, let's recheck it here. Okay, GDC is realigned?

SC Okay, Houston, if you're ready we're gonna pick up the Command Module RCS activation.

CAPCOM Roger, we're standing by.

SC Okay, six arm circuit breakers, 2 of them are going closed, okay, Houston, ready for the logic arm.

CAPCOM You're GO for logic.

SC Okay, logic 1, and logic 2.

CAPCOM America, you're GO for PYRO Arm.

SC Okay, GO for PYRO arm. PYRO arm A
PYRO arm B.

SC Okay.

SC Okay, Houston, coming up on the command
module RCS Pressure. 3, 2, 1, MARK it. And we got it.

SC Boy, you sure can hear it flow in somewhere.

CAPCOM America, Houston. We've got 2 good readings

SC Very good Houston, they're looking good on
board.

SC Okay, safe some PYROS.

CAPCOM Okay, America, Houston. I've got a short
update on your entry checklist.

SC Go ahead.

CAPCOM Over on page 2-4 of the entry checklist,
middle of the page, we would like to delete, EMS mode to
normal at that point. EMS mode to normal, delete. We'd like to move
it over on the 2-5 at 05-G-time. Put EMS mode normal.

SC Okay, we'll get the EMS normal at 05-G.

CAPCOM Roger. We have no update on the entry
pad you are nominal at this time. I do have your weather
information and your ship recovery call signs. Over.

SC Okay, Bob. Why don't you go ahead.

CAPCOM Okay, generally the weather is good, it's
3000 foot scattered, 10-miles visibility. Wind is 130 at 10,
wave heights 2 to 3 feet. Altimeter, 29.94. The altimeter
29.94 will give you a minus 17-foot Delta H which means, Gene,
that when the altimeter says 0 you'll still be 17 feet in the
air. Closest recovery forces, the prime recovery shift is
Tyco, call sign Tyco. Closest recovery will be - aircraft will
be a helicopter call sign RECOVERY and a back up will be
call sign SWIM and they'll be on scene on splash. In case of
the constant G entry for any reason, the aircraft call sign
is SYMOA, rescue 1 will be down range and in the vicinity of
the constant g-point. Over.

SC Okay, we got TYCO, and the prime recovery
ship, prime chopped is RECOVERY, the backup is SWIM and we've got
rescue 1 SYMOA, down range.

CAPCOM I guess that's up range, depending on
how you look at it, Gene.

SC (Laughter) Okay.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/19/72 12:20CST 303:27GET 1072/1

CAPCOM Geno, with weather like that even a Navy captain like you should make a good landing.

SC We'll hang in there TP. You know nobody likes a pitching deck, not even a Navy captain.

CAPCOM Roger.

SC Houston, we'll be back with you and pick it up at 45.

CAPCOM Roger.

PAO This is Apollo Control 49 minutes now away from Apollo 17 entry into the atmosphere. Distance 7883 nautical miles. Velocity continuing to mount 19 774 feet per second.

CAPCOM America, Houston. We would like Jack to give us a call on VHF Alfa. We are reading good signal strength downlink at this time and we'd like to get a signal strength uplink with him at this time also, check please.

SC Okay, this is the LMP on VHF, how do you read 1, 2, 3, 4, 3, 2, 1 - over.

CAPCOM Roger, LMP you're coming through a little bit scratchy but sounds - we can read you. You're sounding good. How me on VHF?

SC You're loud and clear, Bob. Loud and clear.

CAPCOM Okay, good VHF check.

CAPCOM America, Houston.

SC Go ahead.

CAPCOM Just a note of amplification on our change on 2-5 moving the EMS mode normal at 05G time. If the 05G light does not come on at 05G time when you go to normal there, plus 3 seconds go to the normal backup procedures to start the EMS.

SC Okay, I understand that, Bob. Thank you.

CAPCOM Okay, Ron, just a little reminder.

SC Mighty fine.

SC Tape recorder rewind.

SC Okay, we're in range set. Okay crank in 10449.

PAO This is Apollo Control 43 minutes now to entry into the atmosphere. Altitude 6,868. Velocity 20,768 feet per second.

SC 4.9. Okay initial off to set . (garble) in 36 172.

PAO Some of the post atmospheric entry events are - begin blackout 17 seconds after entry end blackout 3 minutes, 37 seconds. Drogue parachute deploy 7 minutes, 39 seconds, main parachute deployment 8 minutes, 26 seconds. Landing 13 minutes, 17 seconds after entry.

SC GARBLE.

END OF TAPE

SC And it's 45 degrees to the right. And 45 degrees to the left. Okay, RSI is zero. MS roll is off. Okay, align the old GDC again.

SC Houston, America. The EMS is initialized; the RSI is aligned and we're ready to pick up the command module RCS checks.

CAPCOM Roger. We're standing by, Gene.

SC Okay, GDC is aligned in the IMU. Okay. And verify HE roll is off. RCS logic 2 circuit breakers are closed. Okay, SCS, minimum impulse.

SC Okay, Houston transfer the command module.

SC Okay. Just a little bitty bump. Okay, Ring one is going off. Okay, we're operating on Ring 2 Ring 2 is all Main B. You can hear it go putt, putt. Putt, putt, okay, (laughter). Happy with Ring 2. Okay, 1 is going up to On; 2 is coming off. Okay, Ring 1 is all Main A. Okay. Yep, you can see it (garble). Okay, it works. Okay, Ring 2 is going back to Main B. 1 is Main A; Ring 2 is Main B. Okay? Okay. Okay, we still got control of the service module.

SC Okay, Houston, the RCS check looks good onboard.

CAPCOM Roger, America, and it looked great down here.

SC CMC in Auto. Yep, clock's running.

SC Okay, Houston, America, we're on top of 2-2. We're going to standby for 30 minutes.

CAPCOM Roger. We're following you right on the line.

SC (Garble)

SC Five minutes to horizon check time. Okay, I'll get back to it, what is it, 268? That's good. Yep. Okay, 29 seconds until .05G (garble). PRD to 07 39. Okay. And no (garble) .05G light 64 is running. A little bit of backup in VHF Ranging, .05G plus 3 seconds. Yeah. If we get the Normal first, that's the main thing, these things can come later. And then we'll get EMS roll on .05G. Now let's see, the third one is really not going to -

PAO This is Apollo Control. Apollo 17 spacecraft now 5381 nautical miles and approaching ever faster to Mother Earth. 22 566 feet per second at the current time.

SC Yeah. (Garble) you just slide your foot in and out of the thing. I wonder what 6 1/2 g's is going to feel like, that half a g in TEI. (Laughter) Felt like I was in the back of the couch. 33 minutes. Get it low. Yeah, it's right on.

SC When is - begin blackout.

SC Okay. Blackout in 17 seconds. Okay. That's comm blackout walkout, by the way. (Laughter)

SC Okay, getting ready for the buss ties.

SC Okay, Houston, BUSS ties are coming on.

APOLLO 17 MISSION COMMENTARY 12/19/72 GET 303:37 CST 1230 MC-1073/2

CAPCOM Roger, America.
SC AC is on and verified; DC is on and verified.
CAPCOM America, Houston. The batteries are on line
and they look good to us.
SC Okay, and tape recorder's on here.
SC Okay.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/19/72 12:41 CST 303:48 GET Mc1074/1

SC Okay, let's start sub-check list here.
SC Okay, Houston, we're pressing ahead
here about 5 minutes early.
CAPCOM Roger.
SC Okay. ELS CSM SEP at A. VAT B
closed. Okay, I'll bypass the old primary radiators. Okay,
repress package valves going ON - ON. Okay, we'll cut off
the service module supply of oxygen. Okay, sewage tank
is verified ON. Okay, pressure relief valves are verified
normal. Okay, we're verified on RCS command. Okay,
secondary fuel is A's B's C's and D's. All open. VHF is
OFF. Hack it.
SC Houston, loads appear to be balanced
on Main A, Main B, fuel cell.
CAPCOM Roger, Jack, we copy that.
SC Okay, don't see anything yet.
SC Houston, step 5 on 2-2 is complete.
CAPCOM Roger, America.
SC or parenthesis 5, I guess it is.
SC Okay.
CAPCOM America, Houston. You may be interested,
we've just taken another look at your last batch of data
and it confirms your pad. You are absolutely nominal -
right on the pad.
SC Good news, Robert. Thank you.
SC Outstanding.
CAPCOM We aim to please.
SC Okay, and we're going to keep it
nominal.
PAO The velocity now is increased to
25 371 feet per second. The next major event will be
separation of the service module and the SIM bay and all
the scientific gear that has fed data down to the Earth
for the past 12 1/2 days. 23 minutes now away from entry.
We're standing by as communications continue to be quite
good on the OMNI antennas through the Hawaii station.
36 minutes away from landing. At 303:55, this is Apollo
Control standing by.
SC That's okay. We're a little bit - a little
bit early.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/19/72 12:51CST 303:58GET 1075/1

SC Okay. Yeah, they look pretty good.

SC Hey, you can go ahead and go out through there now and then I'll - Rate command - dead band - rate flow - okay, rate to high - yeah that's better. Deadband rate to HIGH. SCS. That one there, okay. Yeah, we'll see it - we might. Think you will. (Laughter) I don't know. I've got the sun shining right in my left window here. I don't see anything. Do you see anything, Jack? (Laughter). See that.

SC Yeah.

SC Hey, I've got too much time in flux. Sun's shining in on there - glaring on the window. That's a good as long as it's there somewhere.

SC Oh, I see it. It's off to the left. Oh, it is out the left window (laughter). Okay, yeah, that's a dark horizon.

SC Okay, Houston we've got the horizon now and we're going on AUTO PLANE now.

CAPCOM Roger.

SC Yeah, you can see it better when GARBLE. We must be just seeing the horn. I've got the air (garble) but see that's the horn that's been - we've been seeing all the time that's off to our left.

SC Verify bypass.

SC Okay, standby. Hey Jack, when I yaw down here can you get a picture? Okay B MAGS, right 1, right 2, rate command SPS. Deadband rate to HIGH. Command module RCS logic is ON. GARBLE verified ON. Okay, here come the pyros - pyro A, pyro B.

SC Okay, Houston I'm my mark - I'm going to hit the GARBLE when this comes through.

CAPCOM Roger.

SC 3, 2, 1, MARK.

SC We got it.

SC Didn't we get it. That thing really bangs doesn't it.

SC Looks like we got a good separation, Houston.

SC Okay, minimum impulse. GARBLE.

CAPCOM We're going to be handing over sites in one minute. There'll be a slight break of COMM here.

SC Okay.

CAPCOM We'd like you to go to OMNI Charlie.

SC OMNI Charlie.

SC Okay, we're yawing back to zero.

SC (Laughter) we've got junk all over for you.

PAO Altitude 1781 miles. Velocity 29 486 feet per second. 13 minutes away from entry, 26 from landing.

SC Entry standby 36 170 1044. Okay, we're minimum impulse, rate 2 SES, dregs are on, AC, DC. All right go ahead. GARBLE. But that will be.

SC You know the sound of the jet firing is a lot louder than what we usually have the simulator set for. Okay, we're back to the dark horizon again but picture on down. What --

APOLLO 17 MISSION COMMENTARY 12/19/72 12:51CST 303:58GET 1075/2

SC Okay, there you go. Got everything up.

PAO Flight director, Neil Hutchinson, here in the flight control center is taking a final check among the flight controllers for reentry, an inevitable event in any case. 30407 ground elapsed time, 11 minutes away from entry, 24 minutes away from splashdown. Apollo Control standing by.

SC Okay. Okay, 4153 miles to go. Velocity is 31 253 feet per second, increasing. Okay, Houston we're 63 and we're just standing by for .05G.

CAPCOM Roger, America, you're looking great. We've got a TV picture of the weather in the recovery area, and the ship Ticonderoga and it's looking great.

END OF TAPE

SC Probably warm up after while a little bit. Well this thing kinda want to - wants to yaw left all the time.

CAPCOM America at 9 minutes prior to entry interface here, you're looking great down here.

SC Okay, Bob. We're looking good onboard. Stand by for .05G.

SC (Laughter)

SC Houston, be advised that hydrogen tanks 1 and 2 still seem to be with us. At least I got gage readings about 200 PSI.

CAPCOM Roger. We'll run that one through E-COMM

SC (Laughter).

SC All right, save the 55 for a minute - pressure Main A and Main B, both controllers are ON. That means they got AC-1. Should be 153, I think it is. Here it is right here. Yep, no more eating upside down. I was just getting use to that, a lot of fun.

SC Getting use to it. I was use to it after the 1st - 2nd day. You know the - it wants to trim itself, pitch up too. I gotta keep whappin' the right yaw, and I gotta keep - pitch it down, to make it go down. See the rate just decreases.

SC 10 minutes to Moon, I'd like to see a moon. There it is up there. Can you see it Jack, it's out of window 3.

SC It should be out to your right. You might be able to see it.

SC That's the way the moon looked about 13 - 14 days ago, isn't it. Small one like that.

SC Try the pressures and we'll try and (garble), okay.

SC Okay.

SC 5 minutes to RRG.

SC 304:16 on my card. What's this.

SC Yeah, that's got an opening with a cross coupling on it. We might be picking up c - 55. Might pick it up when he reads anyhow.

SC Probably not yet. Usually about 59.

CAPCOM (Garble) loud and clear, Now, nothing coming through on that transmitter.

SC (Garble)

SC (Garble) disappeared.

SC Couldn't see a star out there if you had to, got that. Floating around out there by the jetts.

PAO Switching communications now, from the Hawaii tracking station, through the Apollo range instrumented aircraft in the Pacific.

SC Which is good.

SPEAKER (garble) through to 18 now, loud and clear.

CAPCOM Roger Stand by.

SC Houston, America, do you still read?
CAPCOM America, Houston. Read you loud and clear,
we're going out through ARIA.
SC Okay.
SC And Houston, mode set was on time.
CAPCOM Roger.
SC And we're coming up altimeter (garble)
and we're going for it.
CAPCOM Roger, America. You're looking great.
SC 40. Cut the (garble) now.
SC Good, good, we're going to see it.
SC (garble) looking good. We got RIG command
to go ahead. Did you all get that?
SC Okay, in about a minute.
SC 400 thousand feet.
SC That's really moving, isn't it?
SC (garble) go by.
SC (Garble)
SC Okay, needle's off the peg now, It's looking
good.
SC Jack, can you take a picture of that, too.
SC Get a picture of the Range -
SC (garble).
SC No that's all right for get it.
SC (Garble)
SC That's all right, I'm sorry.
SC We are 5 seconds from out RT.

END OF TAPE

CAPCOM Roger, America.
SC RRT.
SC Okay, you want to go to Rate Command?
SC Okay. both RG's is 29.
SC We have a drogue.
PAO And the beginning of blackout was at

the predicted time of approximately 17 seconds after entry interface into the atmosphere - 400 000 feet or approximately 85 miles above the Earth. Come out of black out in a total time of about 3 minutes 27 seconds. Following reappearance, at least from a communications stand point, of the space craft. The drogue parachutes, which are 16 1/2 foot diameter, two of them, will be deployed by a mortar - pyrotechnic device at 23 000 feet above the surface. The main parachutes, which consist of three 83 1/2 foot diameter ring sail parachutes, will be pulled out by pilot parachutes - small pilot parachutes at an altitude of 10 1/2 thousand feet. The spacecraft will splash down at approximately 22 miles per hour with 3 fully inflated parachutes. Meanwhile, the crew is using the entry monitor system to steer for the desired aiming point which is some 1044 miles down range from the actual entry point into the atmosphere. The Entry Monitor System - or EMS as it's referred to, gives a display to the crew which gives them the roll angle to steer to the desired track down range - to hit the aiming point. Now the position of the recovery ship, Tyconderoga, may or may not be near the aiming point. The accuracy of the landing is dependent on the distance from the aiming point, not from where the ship is at the time. Should be coming out of black out, as mentioned earlier, at 3 minutes 37 seconds into entry. Less than a minute away and hopefully we will have confirmation from the crew on drogue deployment, and main parachute deployment, assuming that communications through the Apollo range instrumented aircraft called ARIA is good. The Tico - the Ticonderoga, prime recovery ship has reported that they have radar contact with the spacecraft. Probably a skin track of the spacecraft with the ship's radar. We've re-entered black out - reappeared from blackout, I should say. We're waiting for a call from the space - from the CAPCOM.

SC (garble) still at 3 G's.
SC (garble).
SC Okay.
SC 3 G's has got a potential of 130 to
130 range.

CAPCOM Looking good - 3 G's. Right on.
SC Roll right 40.
CAPCOM Okay, right 40.
SC Okay, right -
CAPCOM Right 45.
SC Okay,
CAPCOM Okay, The G is good - move left about 2.8.
SC Okay, (garble).
SC It is reverse. Okay. Hold the dot.
SC Okay, it's still about 2.9 G's. Took
some more pieces off the outside of the spacecraft.
SC Hey, it didn't stay on very long.
SC Okay.
SC Up there about 2.8 G's here.
SC Didn't get a potential 65 65. 8000 feet
a second. That's about 40 - that's right. That was right.
3 degrees.
SC Okay, roll.
SC Okay, Houston, 3.1 G's.
PAO Drogue deployment in two minutes. Mark.
SC Hey, that's good - beautiful from here.
SC Okay, about 3.1 G's. We're about
4500 feet a second. Left roll, 22 miles - 4000 feet a second.
0 plus 88 degrees. Okay, that's good. Okay, looking good.
Okay, we ought to be in there. Roll left about 2.2 G's.
Okay. It feels like some mag around there - I can't
roll that many. Okay. Okay. Roll - that figures - still
good. Okay, 2 G's. (garble) - okay - is that on time?
Drogue is up 39 - okay. (garble). Okay, first (garble)67.
Freeze at 67. Put 1.8 it says; Okay, call it out.
SC Hello Houston. This is America. We're
showing 1.8 short. Yep. Arm the pyros. Calvin pressure to
boost. This is America. We're showing 1.8 miles short. 17.86
by minus 167.5 Bear on. We're stable. Looking
good. Coming down right in front of us. Ahh, I don't
believe it. Okay, Houston, 35K. Stand by for ELS logic, right?
Okay, there goes all the paper off the spacecraft. Okay,
that's 30K. ELS to AUTO - LOGIC and then AUTO. Okay,
stand by for APEX. And it (garble). Okay, there we go.
There goes the drogue. Okay, thank you much. Hey come here,
Jack. Okay, (garble) to GO. All right - hey, it really vibrates.
Okay. Okay, Houston, America in the blind - we got the
(garble) - we got the drogues. We got the drogues. (garble)
Okay, there's 12 13 K. Okay. Okay. Mains at 11 K. Mains (garble) -

APOLLO 17 MISSION COMMENTARY 12/19/72 13:11 CST 304:18 GET MC1077/3

SC There's the mains. Okay. They're reefing. (garble) I can't read them.

SC (garble) 25 zero.

PAO A great deal of cheering and clapping here in Mission Control as the large Eidophor television projector shows the spacecraft hanging on three good main parachutes.

SC Okay, we're coming - Houston, America. We've got three good mains and 6500 feet.

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/19/72 CST 13:21 GET 304:18 MC-1078/1

SC - 00 and 3.5.
RECOVERY Apollo 17, this is recovery.
SC Hello, Recovery, it's a beautiful day.
We're out at 610, we've got 3 good mains.
RECOVER This is Recovery (garble)
PAO Three minutes from splash.
SC Outstanding. And all is well onboard, all
is well onboard.
CAPCOM Wonderful.
SC You sound good down there.
RECOVERY Waiting for you.
RECOVERY Monitor to 0 0
RECOVERY Our positive, 280 at 11.
RECOVERY (Garble). Range 245.
SC Recovery, this is America, we're out at
4000 feet now and all is well.
RECOVERY Forty sec go ahead.
SC Report computer readout, not yet.
SC Houston 50 shows minus 1.3. (Lat
is minus 17.88 long. is minus 166.11.
SC Hello Recovery, America, is through 2000 feet.
RECOVERY Roger.
PAO 1 minute MARK to landing. Predicted landing
time.
SC America's out at 1500 feet.
RECOVERY The parachutes are fully deployed and the
command module is descending. And photo is circling as it descends.
SC And America is now out of 800 feet.
RECOVERY Command Module is descending, stand by
for splash-down.
SC America's at 300 feet.
RECOVERY Splash MARK.
SC Recover, America stable 1 and the crew is go.
PAO A great deal of cheering is going on here
in control center, as the Splash down was watched in real time
from Recovery Helicopter. And MARK the time at 304:31, ground
elapsed time even.
SC Smarts doesn't it.
RECOVERY Command Module is stable 1, the sen state is
mild. The 3 main parachutes are arrayed around the Command Module
at approximately 120 degrees apart.
SC Okay.
RECOVERY (Garble).
SC It's just us.
SC Okay, (garble) looks like we've had a - this is
our MARK.
SC (garble)
SC Oh, that.
SC (Laughter) Have a little water.
RECOVERY Helo S approaching the Command Module.
photo is approaching to the southern side.
SC Then the Chopper, right out here.

RECOVERY Helo S approaching the Command Module to
deploy the first of the ELS swimmers.
SC Guys jumped in the water.
RECOVERY The first 2 swimmers have been deployed.
RECOVERY ELS is approaching their main parachutes.
RECOVERY The second ELS swimmers have been deployed.
SC (Laughter)
RECOVERY Two sets of ELS swimmers have been deployed.
Helo S is coming around for a third pass on the third main
parachute.
SC Beautiful. (Laughter)
SC (garble) things closed, I need some help.
SC (garble)
SC (garble) won't they.
SC (garble)
RECOVERY Helo S is commencing an approach to drop
the third set of ELS swimmers. Helo S is approaching the command
module on the starboard side. Photo is hovering alongside to the
right.
RECOVERY Recovery is waiting downwind.
SC (garble)
SC (garble) America to ALSEP.
RECOVERY This is photo at 1/2 mile.
SC 3.6?
CAPCOM 3.5.
SPEAKER (garble)
RECOVERY You're 3-1/2 miles.
SC Okay, thank you. I guess we're going to have
to argue with the captain whether he was on station or we were.
SPEAKER (garble)
CAPCOM And the third set of ELS swimmers have been
deployed.
SC Okay, we'll have to meet them at the hatch.
RECOVERY And the main parachutes are completely
clear of the command module.
SC Oh, (garble)
RECOVERY Helo S is hovering near the Command Module
SC (garble) pull back now.
SPEAKER (garble) keep cranking that thing, keep cranking.
SPEAKER (garble)
RECOVERY The ELS swimmers are deploying two sets of
1 member rafts.
SC I ought to do something, right?
RECOVERY The Helo S is approaching with one of the sets
of ELS swimmers to deploy the rafts.
SPEAKER Very good. (garble)
SC You made (garble) right?
SC Yeah, yeah.
RECOVERY Life rafts have been deployed.
SC Okay. (Laughter) Feels like we've been here a
long time.
SC Good show, beautiful by God.

APOLLO 17 MISSION COMMENTARY 12/19/72 CST 13:21 GET 304:18 MC-1078/3

CAPCOM (garble) have been deployed by (garble)
SC Very good. Beautiful (garble).
SC (garble) get my hand up there.
RECOVERY The Command Module is riding very well,
main parachutes are completely away from the Command Module.
RECOVERY Recovery is -
SPEAKER There you are.
SC (garble).
RECOVERY A request, if you have a moment to recover -

END OF TAPE

APOLLO 17 MISSION COMMENTARY 12/19/72 GET 304:38 CST 1331 MC-1079/1

SC (garble) securing your beacon, please.
Stand by for (garble) impossible.
SC No, I've got (garble)
SC Yeah, the recovery beacon is OFF.
SC Thank you.
SPEAKER And the ELS is hovering early. ELS swimmers
and raft hovering over the apex cover.
SPEAKER Swimmers, how did you know where the apex
cover is?
SPEAKER Recovery is descending and beginning his
approach toward the command module.
SPEAKER (Garble)
SPEAKER Get it, get the hatch opened. Don't
bend it too much.
SPEAKER Recovery is approaching the command module.
(Garble) on approach.
SPEAKER America, you now have (garble).
SC Roger.
SPEAKER And the swimmer is at the command module.
SC Okay, and the crew is doing fine. We've
all got our sea legs. (Laughter)
CAPCOM Roger.
SC Sure was, thank God.
SPEAKER (Garble)
SC We were only a hundred feet on the gauge.
(Laughter) I was going to call a hundred feet and we hit the
water. (Garble) run up later.
SPEAKER And the swimmer has attached the sea anchor.
SC (Garble) America.
CAPCOM Go ahead, America.
SC Okay, in about a minute and a half here
we'll go ahead enter our float bag.
CAPCOM (Garble) Recovery right there?
SPEAKER And we'll give you a call before we start
pumping them up.
CAPCOM Roger.
SPEAKER The ELS is (garble) between the command
module and photo.
SPEAKER And the swimmer has deployed the sea
anchor, throwing it out to the end of the attaching cord.
SC Beautiful check. Boy howdy, what a life.
(Garble)
SPEAKER The ELS has deployed a third set of men
out.
SC (Garble)
SPEAKER A swimmer has returned to the command module.
The sea anchor has been deployed and the water is somewhat
clearer and I can see a swimmer has deployed collar on.

SPEAKER (Garble)
PAO We've had confirmation that the sea anchor has been attached to the spacecraft. Ron Evans still on voice actuated circuit.
SPEAKER Recovery descending to 10 feet and approaching the command module, putting on the collar and the swimmers are in the doorway.
SPEAKER (Garble)
SPEAKER Flotation collars have been deployed and we have (garble) of the swimmers.
SC Now.
SPEAKER (Garble)
SPEAKER Swimmers are in the command module with the (garble).
SPEAKER And Recovery, looks like a beautiful day for recovery out there.
RECOVERY We ordered it especially for you.
SPEAKER I command you.
SPEAKER The swimmers have positioned the flotation collar on the downward side of the command module. Now, Recovery is hovering downward and slightly to the left. The three uprighting bags are being inflated. (Garble)
SPEAKER Port (garble). Standby.
SPEAKER The last swimmer --
SPEAKER -- in the raft, and swimmers hovering near the (garble).
SPEAKER Got that one tied up.
SPEAKER The droguing attach to the Command Module.
SPEAKER (Garble) should give us a (garble) time and distance from contact (garble).
SPEAKER And the swimmers are (garble) flotation collar.
SPEAKER (Garbled) warning. Apex cover, apex cover. (Garble) port beam 200 yards. And, the flotation collar is being deployed around the command module.
SPEAKER Is there a drogue blown up out --
SPEAKER Yeah, we should (garble).
SPEAKER Was there a big buoy when they came in?
Over.
SPEAKER Flotation collar's deployed and it's being attached.
SC Yep. We're really rolling around in this place. (Laughter)
SC You bet.
SPEAKER Looks lika a (garble) swimmer (garble), and the flotation collar is around the command module, and is being adjusted.
SPEAKER (Garble) Michael, what's your position?

SPEAKER Overhead at this time (garble).
SC Did you hear that?
SC Pick 'em up and hook them on to it?
SPEAKER And, the flotation collar's attached
and the swimmers are checking the flotation collar and
adjusting it.
SC Yeah, that's about it.
SPEAKER One uprighting bag appears to have fully
inflated, and the other two are still in the process of
inflation.
SPEAKER The flotation collar is being inflated.
SC Recovery, this is America. Sounds like
those guys are doing a super job out there.
SPEAKER Well, you've got the first team here
today.
SC Yeah.
SPEAKER All parachutes secure and strapped. Over.
SPEAKER Hey, helo's copying. Were you asking
me something?
SPEAKER Flotation collar has been inflated and
the swimmers have climbed up on the flotation collar.
SC It's just that I'm kind of tired. (Garble)
SC There. (Laughter)
SPEAKER The swimmers are attaching the tie-bolt
straps. And, the main parachutes are in the ELS raft. The
swimmer is signaling to Recovery for the egress raft.
SC There's (garble).
SPEAKER Recovery is descending and moving towards
the command module.
SC I guess I think I ought to step away
with you (garble).

END OF TAPE

APOLLO 17 MISSION COMMENTARY, 12/19/72 13:41CST 304:48GET 1080/1

SC The egress raft has been deployed.
RECOVERY GARBLE has reported recovery of the egress cover. The egress raft is at the flotation collar.
SC Roger.
RECOVERY Egress raft is staying attached to the flotation collar.
PAO Swimmers in the water around the command module will jump from the Recovery Helicopter. Swim team leader, Lieutenant Jonathan Smart of Belmont Massachusetts, Chief aircraft Mechanic, Terrence M. Moy of Newport, Rhode Island, and Radioman Seaman Roy A. Buehler of Carleton Missouri. Recovery - Recovery Helicopter is piloted by Commander Edward E. Dale, III of South Dartmouth, Massachusetts.
RECOVERY GARBLE also.
RECOVERY Ticonderoga is in the background at approximately 1/2 mile.
RECOVERY Okay.
RECOVERY Two swimmers in the egress raft. They're making final attachment.
PAO It has been reported that the apex cover of the spacecraft and all three main parachutes have been recovered by the recovery forces on the scene. And the Ticonderoga has launched the motor whale boat.
SC And a row boat.
RECOVERY And the whale boat is enroute to ELS GARBLE and the main parachute.
SC (Laughter) My computer. I'm more concerned with the GARBLE out there. I couldn't see this little dot - all I could see was the top of something.
RECOVERY All three swimmers all are in the egress raft.
RECOVERY ELS and recovery are standing by in the standby zone. I don't know how they're going to do that one.
RECOVERY Three swimmers are out in the egress raft, and are attaching it to the flotation collar.
SC Man they are really working long.
SPEAKER The uprighting bags are fully inflated. And the swimmers are signalling the recovery - deploy the drop bag.
SC Recovery this is America, we're standby for your call on opening the hatch.
SC Hello, Recovery, America.
RECOVERY Go ahead, America.
RECOVERY Okay, I'm going to standby for your call on opening the hatch.
SC Recovery, roger. Trying to get your signal from UTD crewman there.
RECOVERY Okay, fine. Thank you. (garble)
SC GARBLE command module is well on it's way.
SC I've got it.

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SPEAKER GARBLE bag GARBLE.
SC (Laughter).
RECOVERY And Recovery is moving in towards the command
module, positioning the drop bag at the egress raft.
RECOVERY And Recovery is positioning the drop bag -
at the egress raft.
SPEAKER GARBLE.
RECOVERY And the swimmers have the drop bag and they're
disconnecting it from the hoist.
SC Well, I can't believe it (laughing). GARBLE
SC GARBLE.
RECOVERY Recovery has moved back and the swimmers have
the drop bag.
SC I'm thinking I'll get a black eye this way.
SC Yep, you sure will.
RECOVERY One swimmer on the spacecraft collar near egress
hatch.
SC Hey, hey.
RECOVERY And the swimmer has opened the egress hatch.
SC Got GARBLE.
SC Help us, okay.
RECOVERY Swimmer has passed the drop bag to the astro-
nauts and has reclosed the egress hatch.
PAO Texas Congressman Olin Teague visiting the con-
trol room now, shaking hands with management and flight controllers
as we observe the recovery operations on the Eidaphor Television
projector in the front of the control room.
RECOVERY Swimmers are wading to the egress raft and
the astronauts have given the -
PAO Congressman Teague has been joined in the con-
trol center by Congressman Bob Casey from the Houston area who is
shaking hands with some of the flight surgeons at the flight surgeon
console.
RECOVERY Swimmers are in the egress raft, one swimmer is
on the flotation collar. The motor whale is happy at the ELS
is approaching the ELS raft. The swimmers have the apex cover
aboard theei raft. Swimmer is on the flotation collar peering
into the command module.
END OF TAPE

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RECOVERY GARBLE. Completed and attached and GARBLE
RECOVERY photo and ELS hovering in the area of the command module.

RECOVERY In egress rafts. And command module and
swimmers are riding the ship well. The well is very moderate,
maybe 2 feet. 2 to 4 feet swell.

PAO Flight Director, Neil Hutchinson, has asked every-
one in the control center to restrain themselves from lighting
their splashdown cigars until the crew is on the deck of the recovery
ship.

RECOVERY A swimmer has opened the hatch slightly and
is talking to the astronauts. The astronauts have passed a box
to the swimmers and the swimmers have placed it in the egress raft.
And the first astronaut is exiting the command module. GARBLE.
The swimmer is inflating the astronaut's life preserver unit. And the
first astronaut is in the egress raft. The second astronaut is
exiting the command module. The second astronaut's life preserver
unit is being inflated. The astronauts are shaking hands with the
UDE swimmers. The third astronaut is egressing from the command
module. And the third astronaut's life preserver unit has been
inflated. And that third astronaut and the UDC swimmer are on the
flotation collar and are closing the egress hatch. The egress
hatch has been closed and secures. (Inaudible)

END OF TAPE

PAO This is Apollo Control. The control room here is quite full of people. Off shift flight controllers, management people watching the recovery operations in progress on the large television projector at the front of the control room. Waiting for that moment when the crew is safely on the deck of the ship to fire up their traditional splashdown cigars.

SPEAKER Land only long enough to drop off several of the photographers, the still photographers and the motion picture photographers from NASA who have been on board. They will get themselves into position to photograph the ceremony and then the chopper will go back upstairs. Because Sam Drury - our cameraman - the man who is giving us all those wonderful shots - the closeup shots of the command module on the water - we want to get back up topside so we can get more pictures of the Ticonderoga during the ceremony. The ceremony, itself, is outlined rather extensively in the instructional sheet and the Astronauts are reading perhaps right now.

PAO This is Apollo Control here in the control center. The Network controller has climbed a tall ladder to hang the final in the Apollo plaques along the upper wall of the control center. All the cigars are still unlit, waiting in the mouths of the flight control team, for the actual time the crew is safely on deck of the Ticonderoga. Waiting as the helicopters approach the ship, great deal of joviality under way here in the control center. Hand shaking, best wishes, from management, flight controllers, other people who have been associated with the Apollo Program for the past ten years. Network controller still at the top of his ladder spring loaded to hang the plaque on the wall -

END OF TAPE

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SPEAKER Since they are to go below deck and undergo a rather extensive medical - examinations maybe they'd just like to delay that just a little bit.

SPEAKER GARBLE.

SPEAKER That was Samoa rescue 1. The airplane that has been up over head and that was available if any other kind of rescue operation had been indicated, it wasn't. Everybody will start circling back toward this ship, including the radar planes that had been out to assist.

SPEAKER And locate on the spacecraft as it came down toward the Pacific. And there will be some celebration on this ship. This evening a party with the astronauts and special guests - but most of the time after they get on the ship they will be spending time in the scientific laboratories aboard. The ones that are prepared for the Skylab program that are being used here on the Apollo 17 mission. They won't even get a chance to take a shower for more than an hour. The other thing that they'd probably like to be doing is calling their families at home but there's no time located in the schedule for that. No time allocated for that until 5 o'clock this afternoon. Quick calculation tells us that that will be about 9 o'clock eastern time ladies so they will be calling you at that time. Now 001 and 002 moving in toward the deck of the Ticonderoga. All ready the men are prepared to roll out that red carpet. And there's a shot from our photo helicopter. You can see it landing on the fantail, 001 helicopter, you can also see 002 as it flies away. It will not be landing now because the recorders turned on and the ceremony will be ready to begin.

PAO This is Apollo Control with the helicopter safely on the deck. The network controller, Dave Young, will hang the final placque in the Apollo series on the upper wall of the control room here. And this circuit, known up until now as Gemini Control and Apollo Control will reappear as Skylab Control in the spring. This is Apollo Control out at 305:25 ground elapsed time.

SPEAKER Also in the foreground the bald headed man in the middle of the picture, Dr. Don Stalkin who is the NASA team leader. He will be the first man on the deck to be seen by the astronauts. He will be the man who will step up to greet them, and to remind them again of what they have already been told on the instructional sheet. Watch out for your heads - for Schmitt and Evans. Step down three steps. Wave and smile. And the instruction sheet says follow me. GARBLE.

SPEAKER GARBLE arriving.

SPEAKER The carpet is down. (Music) All three men, one at a time. And now they are out on the deck. The middle man is Evans all right. (Cheer) And they are in proper array as the band strikes up Anchors Aweigh as could be predicted. Cernan in front, Schmitt in the middle. Being greeted by Admiral Butts, by Captain Norman Green and by Air Force General David Jones. Some pretty happy looking astronauts. On the stage that is prepared for them - Captain Green.

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GREEN It gives me great pleasure this morning, to welcome the crew of Apollo 17 back from the Moon to the deck of Ticonderoga. We on Ticonderoga are very proud to be a part of this historic mission. Chaplain John Ecker will offer our prayer to almighty God for the safe return of these three astronauts.

ECKER The heavens declare your glory oh Lord. The planets, the sun, the moon, and the stars which you set in place, in humble gratitude we thank you for the safe return from your heaven of these pioneers in space. May their achievements contribute to the unity of mankind and peace for all your people in this holy season. Amen.

END OF TAPE

SPEAKER Commander of Manned Space Flight Recovery Forces Pacific. Rear Admiral John L. Butts.

BUTTS (Applause) Captain Cernan, you and your crew of Apollo 17, all the men of the Recovery Force, all the ships, units and aircrafts, join me in expressing our great pride in your accomplishments today. And as you noticed Captain Cernan, on your left we have distinguished members of the Congress of the United States here to welcome you back aboard, as well as the Governor of American Samoa. And all of these gentlemen join me in telling you how happy we are to have you home. I'd like to introduce Major General David M. Jones, The Department of Defense Manager for Manned Space Flight Support Operations. General Jones.

JONES (Applause) On behalf of the entire Department of Defense Apollo Support Team, we're honored to welcome the crew of Apollo 17. The Army, Navy, Air Force, Marine Teams that have supported the Apollo - entire Apollo Program are particularly pleased to offer our congratulations on your flawless performance. I am proud to present the crew of Apollo 17, Captain Gene Cernan, Dr. Jack Schmitt, and Commander Ron Cernan. And I believe it's all yours.

CERNAN (Applause) Let me say that first of all, how good it is to be home. You know, no matter where you go or where the trip takes you, it's always good to get home. Admiral Butts, I'd like to congratulate you and really thank you for allowing the three of us to be part of your recovery team, because, today was just absolutely fantastic. And a day I know we'll never forget as long as we live. And in all due respect to General Jones, we got our start on the Atlantic Missile Range so to speak. But, I think we just proved over these last 13 days, that when you want to end something right, whether it be a recovery or whether it be an Apollo Program, by golly, you've got to call on the Navy. (Cheers) And I'm going to see if I can talk Captain Green into splitting miss distance with me today. And I don't think we have too much to quarrel about. I do want to say, this has been an extremely rewarding 13 days for us. Thirteen days that I hope, people throughout the world can share with us, when it was happening, and certainly, I hope, in the future after we sort of gather it all together and find out how much we really learned. We think we flew a good mission, we think we accomplished something, and by golly, we're proud of it. You know, a few years back, I was on a deck of a carrier like this after Apollo 10, when I came back from the Moon and I was extremely excited and enthused, certainly no more than I am now. But, I said at that time, when I came back and I just have reproved it to myself that, that nothing is impossible in this world, when dedicated people are involved. And it's a fundamental law of nature, that either you must grow, or you must die. Whether that be an idea, whether that be a man, whether that be a flower or a country, I thank God that our country is chosen to grow. I'm really proud to be here, I'm proud to be part of Apollo 17

CERNAN I'm proud to be a part of NASA, I'm very proud to be a Captain in the Navy, and most of all, I'm proud to be an American. And I'd like to present another guy who's pretty proud to be an American, and in turn I'll let him present the 3rd member of our crew. But, first Commander Ron Evans.
(Applause)

EVANS Thank you, Gene, General Green, - Captain Green, (Laughter) Admiral. You know, about 6-1/2 years ago, I was fortunate enough to be on the Ticonderoga, where I was notified, of my selection to the Astronaut Corps. I think it's quite fitting that I should happen to have the opportunity to be picked up by the Tico after our journey to the Moon. To me that's really something. The fact that, it was the Ticonderoga, is part of the United States Navy, the fact that I'm a Commander in the United States Navy, and I flew the United States Spacecraft America, to the Moon and back, I'm really honored and I'm proud. That's about the best way I can express it. And I think right now I'd like to present not our 3rd crew member, but the 3rd member of the Apollo 17 crew. Jack Schmitt.
(Applause)

SCHMITT Thank you. I'm happy to be here and I guess I never will be Navy. (Laughter) I'm sorry. But, if there was ever a team I'd like to be part of it's this one. Thank you very much. (Applause)

PAO And so the Astronauts are done with their ceremony and are doing what the sheet told them to not to do, they're shaking hands over there. The sheet said just step off the platform turn left and wave their salute, but they either forgot or decided to go ahead and do their thing -

END OF TAPE