APOLLO 14 AIR/GROUND TRANSCRIPT INDEX

TABLE 6-I.- SEQUENCE OF EVENTS[a]

	Elapsed time, hr:min:sec
Range zero - 21:03:02 G.m.t., January 31, 1971	
Lift-off - 21:03:02.6 G.m.t., January 31, 1971	
Translunar injection maneuver, Firing time = 350.8 sec	02:28:32
Translunar injection	02:34:32
S-IVB/command module separation	03:02:29
Translunar docking	04:56:56
Spacecraft ejection	05:47:14
First midcourse correction, Firing time = 10.1 sec	30:36:08
Second midcourse correction, Firing time = 0.65 sec	76:58:12
Lunar orbit insertion, Firing time = 370.8 sec	81:56:41
S-IVB lunar impact	82:37:52
Descent orbit insertion, Firing time = 20.8 sec	86:10:53
Lunar module undocking and separation	103:47:42
Circularization maneuver, Firing time = 4 sec	105:11:46
Powered descent initiation, Firing time = 764.6 sec	108:02:27
Lunar landing	108:15:09
Start first extravehicular activity	113:39:11
First data from Apollo lunar surface experiment package	116:47:58
Plane change, Firing time = 18.5 sec	117:29:33
Complete first extravehicular activity	118:27:01
Start second extravehicular activity	131:08:13
End second extravehicular activity	135:42:54
Lunar lift-off, Firing time = 432.1 sec	141:45:40
Vernier adjustment maneuver, Firing time = 12.1 sec	141:56:49
Terminal phase initiation	142:30:51
Terminal phase finalization	143:13:29
Docking	143:32:51
Lunar module jettison	145:44:58
Separation maneuver	145:49:43
Lunar module deorbit maneuver, Firing time = 76.2 sec	147:14:17
Lunar module lunar impact	147:42:23
Transearth injection, Firing time = 149.2 sec	148:36:02
Third midcourse correction, Firing time = 3.0 sec	165:34:57
Command module/service module separation	215:32:42
Entry interface	215:47:45
Begin blackout	215:48:02
End blackout	215:51:19
Drogue deployment	215:56:08
Landing	216:01:58

[a]See table 6-II for event definitions.

SPEAKER This is Kennedy Launch Control at T-1 hour 30 minutes and counting now 90 minutes away from the Apollo 14 liftoff. All aspects of the countdown still running smoothly at this time. In fact, a number of nontime critical items have been accomplished well ahead of their prescribed time in the countdown. We're essentially ahead in the count with all going well. At the white room level the closeout crew now has completed purging the cabin, bringing it to the proper environment and they are just doing the finishing touches on placeing the boost protector cover on the hatch. All aspects going well with the count. Other work in process during this period is Spacecraft Commander Alan Shepard now has come back on line with the spacecraft test conductor and is securing from this rather extensive emergency detection system checks that had been in progress. Now, here in the firing room, we're performing some special tests of the flight computer. We're running it through a prepare to launch mode, exercising the flight computer to insure that it will, in fact, operate satisfactorily in flight. Houston flight is standing by at this time to send some commands to the launch vehicle. This will be coming up in a few minutes. This is Mitch, the flight director in Houston has the capability of sending commands to the vehicle in flight. We want to check this at this point to be sure that the Houston commands actually will get through to the vehicle and that it is verified. We're at 1 hour, 28 minutes, 29 seconds and counting. This is Kennedy Launch Control.

END OF TAPE

SPEAKER This is Kennedy Launch Control at T-minus 1 hour, 23 minutes and counting. All still proceeding very smoothly with the Apollo 14 count at this time. Astronaut Alan Shepard aboard the Apollo 14 spacecraft now busy with the start of some extensive guidance and command checks that will be inprogress for the next 10 or 15 minutes or so. This starts with checks of stabilization and control system of the spacecraft and also checks out the various guidance controls on board. T-minus 1 hour, 22 minutes, 29 seconds and counting and this is Kennedy Launch Control.

END OF TAPE

PAO This is Kennedy Launch Control at T minus one hour ten minutes and counting, now 70 minutes away from the Apollo 14 liftoff. We're still proceeding very satisfactorily at this time. Our weather posture seems to be improving. However, we are still keeping a close look on that weather front to the west of us. A squall in front of it seems to be breaking up. However, it is still being looked at closely. As far as weather in the Atlantic Ocean, which had had high seas and some high winds, it appears that the most severe aspect of that weather will be north of the trajectory on the flight. This is the area that would be concerned with am emergency abort condition. It is predicted that the more severe weather will not move into - anywhere along the line of the track. As a result, we appear to be GO as far as the abort weather conditions are concerned. In the meanwhile, Alan Shepard, the spacecraft commander, now in the midst of his guidance and control checks working with spacecraft conductor Skip Chauvin. At one point in this test he does actually drive that big service propulsion system engine below him. He actually gimbals the engine, has it sway in response to commands from the spacecraft. We also are checking here in the firing room two of the two tracking beacons on the launch vehicle that are used for C-band radar tracks during the powered phase of the flight. Astronauts Dave Scott and Jim Erwin, the commander and lunar module pilots of the Apollo 15 mission, are here in the firing room at this time, and they are at this point talking with acting administrator George Low and Dr. Werner von Braun. Our countdown is proceeding, T minus one hour 8 minutes 17 seconds and counting. This is Kennedy Launch Control.

END OF TAPE

SPEAKR This is Kennedy Launch Control at T-60 minutes and counting. T-60, one hour away from the Apollo 14 liftoff. All aspects of the countdown still proceeding very satisfactorily at this time. As a matter of fact, a number of events with some 10 or 15 minutes ahead of the assigned work in the countdown manual. Because of this the Apollo access arms swing on number 9, will probably come back about 10 minutes earlier than it usually would in the countdown. By coming back early, it will be moving in about 7 or 8 minutes from this point. It's moved 12 degrees from the spacecraft -- that's about 6 feet -- and remains in that standby position until a 5 minute mark in the count when it's fully retracted. A short while ago Alan Shepard was told by the Spacecraft Test Conductor, Skip Chauvin, things were going very well and that we were ahead on the count. Alan at that point said thank him for the information and said how's the weather out there. The reply came back that there is some cover but it looks pretty fair. Actually the clouds we have in the area at the present time have a base of about 3000 feet and extend up to 8000 feet with some getting as high as 12,000 feet. This does not appear to be any constraint to a launch attempt as far as the cloud cover is concerned at this time. That's our status. The countdown is still running smoothly. We're GO on Apollo 14. T-58 minutes, 33 seconds and counting. This is Kennedy Launch Control.

END OF TAPE

PAO This is Kennedy Launch Control, T-55 minutes and counting. T-55 and counting all still proceeding very satisfactorily with Apollo 14. We've just completed some telemetry checks of the launch vehicle as the launch continues. The astronaut crew has been advised that the swing arm, the Apollo access arm swing on number 9 will be coming back in about a minute and 40 seconds from this time. We will remain in a standby position about 6 feet from the spacecraft until we reach the five minute mark in the count when it will be fully retracted. The pad leader and the closeout crew have departed from the 320 foot level and are now at the roadblock position standing by. For an update on network operations concerned with the mission, we now switch to mission control in Houston.

PAO This is Apollo Control, Houston at minus 54 minutes and counting. The worldwide manned spaceflight network is prepared for launch at this time. Only one problem has emerged. This is a very minor problem. At Carnarvon seaband coverage is red because of computer problems, however, this gives no constraint to launch because of the unified S-band coverage in that area. Weather conditions along the ground track across the Atlantic are expected to be satisfactory as it has been reported with one area of high winds and seas midway between Florida and Bermuda. In the area we expect southwesterly winds of some 25 to 30 knots and seas of 8 to 12 feet. Here in Mission Control except for a few more people than we see in simulations, it's much the same. A quiet calmness best describes the mood of the control center as the Houston Flight Control Team monitors the final countdown now in progress. However, in less than an hour the atmosphere here will change when the control of the flight switches to Houston. Our flight director today, Pete Frank will be calling for rapid status reports from each member of the his team throughout the booster or powered phase of flight. Over what is known as the flight director's loop we expect to hear a great deal from a gentleman named Dave Reed, our flight dynamics officer and Frank Van Rensiler the booster systems engineer. Since they will be monitoring the crucial trajectory and launch vehicle data. We're at minus 52 minutes and this is Apollo Control Houston.

PAO This is Kennedy Launch Control, we're now 52 minutes, 13 seconds and counting. And as the astronauts were alerted, it did occur. The Apollo access arm now has been retracted and is in the standby position. As soon as the arm is retracted, the pyrotechnic systems within the spacecraft are armed. This means now that 155 pound thrust escape tower that is atop of the spacecraft can be deployed in a critical emergency if necessary from this point down in the countdown. 51 minutes, 42 seconds and counting. This is Kennedy Launch Control.

END OF TAPE

SPEAKER This is Kennedy Launch Control. T minus 45 minutes and counting. T minus 45 still GO with Apollo 14 in the countdown at this time. Just a matter of a few minutes ago astronaut Stu Roosa wound up pressurizing the reaction control system of the Service Module on the spacecraft. These are the big 100 lb. thrust engines which are in quandrants - 4 quadrants around the side of the Service Module which are used for certain types of spacecraft maneuvers on the trajectory to and from the moon. Stu Roosa read out the various pressures involved in the different quadrants and they were recorded by the spacecraft test conductor. Coming up in a matter of a few minutes will be one of the final major checks of the range safety command destruct system aboard the vehicle. These are the destruct packages in each of the stages which would be initiated in the event the vehicle veered violently off trajectory and could be a danger to anyone or anything below. Of course before destruct action would ever occur the escape tower first would be triggered on the spacecraft to successfully separate the astronauts from the vehicle in trouble. 43 minutes, 43 seconds and counting, this is Kennedy Launch Control.

END OF TAPE

PAO This is Kennedy Launch Control at T minus 40 minutes and counting. T minus 40, we are proceeding satisfactorily with Apollo 14. Just as this announcement began, we began a key check here in the firing room of power transfer test in which we switched from the external power on the vehicle to the batteries in each of the three stages and the instrument unit of the Saturn 5. This test is in progress at this time and after we are assured that all batteries are operating satisfactorily, we will return to external power in order to preserve the power of those batteries for the actual power phase of flight. We actually will return to internal power at 50 seconds in the countdown. The astronauts are standing by in the spacecraft at the 320 foot level of launch pad A. They are about 10 minutes ahead in their work and they have finished up the pressurization of the reaction control system of the Apollo spacecraft. 39 minutes and counting. We're go with Apollo 14 at this time. We will take a close look at our cloud conditions at about the 10 minute mark count to determine our status. Now 38 minutes, 45 seconds and counting. This is Kennedy Launch Control.

END OF TAPE

PAO This is Kennedy Launch Control at T minus 35 minutes and counting. T minus 35 and all going well with Apollo 14. The Astronauts have just been advised by the spacecraft test conductor Skip Chauvin that we've just passed the 35 minute mark and a crisp "Roger" came back in reply. The countdown is still going well and we're keeping a close look at our cloud cover and we'll proceed to countdown to the 10 minute mark and take a close look there and if it appears that we will be clear we will continue our countdown down through liftoff. We have completed our power transfer test and all is still going well with the count. Thirty four minutes, twenty one seconds and counting. This is Kennedy Launch Control.

END OF TAPE

PAO This is Kennedy Launch Control at T minus 30 minutes and counting, T minus 30, all elements of the Apollo 14 countdown still go at this time. At this point in the count the Apollo 14 lunar module, named Antares is now going on internal power. There are 2 batteries in the ascent stage and 4 batteries on the descent stage of the lunar module for Apollo 14. The lunar module will remain internal for some 20 minutes until the 10 minute mark in the count as we take a final look at the lunar module systems before we're ready to commit to fly. The LM then again will be powered down at the 10 minute mark in the countdown. Still well ahead on a number of functions - the astronauts standing by in the spacecraft, all still going well. T-minus 29 minutes 10 seconds and counting. This is Kennedy Launch Control.

END OF TAPE

PAO This is Kennedy Launch Control, T minus 25 minutes and counting, T minus 25. All is still go with the Apollo 14 count. We are keeping a close look on the clouds in the KSC area, particularly here at complex 39 at this time. These clouds are ranging from 3 to 8 thousand feet at the present time. We'll take a close look at the 10 minute mark to determine our posture to continue the count. We're still aiming at this time toward our planned T zero lift off at 3:23 PM Eastern Standard time. In progress here in firing room 2, the crew is monitoring some automatic telemetry calibrations of the saturn 5 launch vehicle. This is to assure that we are properly calibrated to receive the in flight information during the powered phase of the mission. 24 minutes 11 seconds and counting, this is Kennedy Launch Control.

END OF TAPE.

SPEAKER T minus 23. We are GO with Apollo 14 at this time. Just a matter of seconds ago, the spacecraft Commander Alan Shepard was advised of the status of the count at the 24 minute mark. Shepard reported back, he said, "It's rather quiet out there" and he was informed it was quiet because things are going so well. He was referring to the communications circuit he's on. He said, "I'm glad to hear that." This is Kennedy Launch Control.

END OF TAPE

PAO This is Kennedy Launch Control, T minus 23 minutes and counting, T minus 23 - - This is Kennedy Launch Control, T minus 20 minutes and counting. T minus 20. Still go with Apollo 14 at this time. The Vice President of the United States, Spiro Agnew and the Royal Highnesses the Prince and Princess of Spain have arrived at the viewing site at this time. Meanwhile here in the firing room, we're continuing to monitor the status of all those propellants, more than a million gallons of propellants aboard the Saturn 5 launch vehicle. The reports keep coming back that all is still going well. The astronauts standing by in the spacecraft at this point. We're keeping a close eye on the clouds overhead and we'll take a hard look at the situation at the 10 minute mark in the count to determine our progress from then on down. T minus 19 minutes, 15 seconds and counting. This is Kennedy Launch Control.

END OF TAPE

PAO This is Kennedy Launch Control, T minus 15 minutes and counting, T minus 15. We are still go with our count down, taking a close look at cloud conditions, and we'll take a close look at the 10 minute mark in the count. Starting at this point the astronaut crew is going to be quite busy in the spacecraft as the Apollo 14 spacecraft goes on full internal power. This is the full internal power of the fuel cell. Up to this time in the countdown, we've been sharing the load sort of speak with an external power source along with the fuel cells. As we go on internal power, the Lunar Module Pilot, Ed Mitchell will give readouts to the spacecraft test conductor on how the power situation looks. Spacecraft Commander, Alan Shepard will also give some final readouts on the stabilization and control system of the Apollo spacecraft. Both Shepard and Stu Roosa will arm the rotational hand controllers that are on their arm rest in the cabin. We'll take a close look at the clouds at the 10 minute mark in the count to determine our posture for proceeding with the countdown. Thirteen minutes, 55 seconds and counting, this is Kennedy Launch Control.

END OF TAPE.

PAO This is Kennedy Launch Control at T minus 10 minutes and counting, t minus 10. We are proceeding at this time, however, the weather conditions - the clouds in the area are being evaluated at this point. If a hold is required, it could occur about 2 minutes from this time. We'll stand by for further reports. In the meantime, in the Apollo 14 flight crew have completed some checks on what's called the after launch circuit. This is a special radio frequency circuit used by the spacecraft communicator, the launch operations manager and the spacecraft test conductor to advise the astronauts of abort conditions. This is Kennedy Launch Control. We are now advised that we will hold for weather. We will hold the countdown at the 8 minute mark in the count. We're now at 9 minutes 10 seconds and counting. We repeat, we will hold with the countdown at the 8 minute mark because of cloud conditions in the launch facility area. This is Kennedy Launch Control

END OF TAPE

PAO This is Kennedy Launch Control. We're standing by we're coming up in the 8 minute mark of this flight. Mark, we are holding. The clock shows 8 minutes and 2 seconds in the count. We are holding at this time. The reason for the hold is cloud conditions in the area. It appeared that one bad cloud patch could be over the launch pad at the planned time of 23 minutes past the hour. We are standing by at this time, at 8 minutes and 2 seconds and holding. This is Kennedy Launch Control.

END OF TAPE.

SPEAKER This is Kennedy Launch Control. We remain on our HOLD on the Apollo 14 countdown. The clock reading minus 8 minutes and 2 seconds and HOLDING. The reason, cloud conditions in the area. We have had an aircraft aloft in the area during - of the full progress of the final countdown and we were advised that the ten minute mark on the count, that it appeared one particular cloud cell coming across the Indian River that is coming west over the launch pad area appeared to have rain in it and some potential and it was reaching up to altitudes of some 15 000 feet. As a result, the Launch Director, Walt Kapryan determined that we should HOLD. We're going to remain in this posture at approximately 8 minute mark to try to be no more than some 10 minutes away from a launch attempt as long as this is possible. We are going to be advised by the flying aircraft of conditions and hopefully be able to get a forecast that things will look better in 15 minute increments. That is when we get a GO from the aircraft, we will be able to launch some 15 minutes later. So we do not have a firm estimate at this time. However, the aircraft commander has advised that he feels he will be able to give us one in a short while. That is our situation, standing by at 8 minutes and 2 seconds and HOLDING. The Apollo 14 crew has been advised. They're also standing by in the spacecraft. It is possible we may get some rain in the area shortly from this same cloud cell that we were concerned about for the launch attempt. This is Kennedy Launch Control.

END OF TAPE

PAO This is Kennedy Launch Control. We remain in our hold at T minus 8 minutes and 2 seconds and holding because of cloud conditions in the area. We can remain in this posture at the 8 minute mark for approximately one hour. If we had to remain in the hold longer, we would have to recycle to an earlier mark in the countdown. But we can remain here at the 8 minute mark for approximately one hour from the time the count was held. Our situation as far as the clouds are concerned: - from the latest advice from the aircraft is, at its earliest, these cloud conditions might be able to pass through this area in about 15 minutes. If at the end of that time the aircraft could give us a good forecast that would be fairly clear for 20 minutes beyond that time, it's very possible that countdown could be resumed. However, we expect to be in this position at the present time for at least 15 to 20 minutes. We remain at T minus 8 minutes, 2 seconds and holding. This is Kennedy Launch Control.

END OF TAPE

PAO This is Kennedy Launch Control, we remain in our hold at T minus 8 minutes and 2 seconds by the clock. The launch vehicle test conductor Gene Sestile has just advised all the support elements for the 3 stages in instrument of Saturn 5 that the best estimate at this time is this hold will continue for another 15 minutes. He also pointed out to his test conductors for the various stages that they should be ready when they are alerted to be able to pick up the count at the 8 minute mark. That is our status. We are waiting further word from the aircraft that's surveying the clouds from the top, and we remain at T minus 8 minutes. This is Kennedy Launch Control.

END OF TAPE

PAO This is Kennedy Launch Control. We remain in our hold at the 8 minute and 2 second mark on the Apollo 14 countdown. The national weather service's aircraft in the area now advises that this cloud build-up that we have should continue through the area for another 15 to 30 minutes. However, he reports that presently just northwest of the Kennedy Space Center and northwest of the city of Titusville, the area does appear to be clearer and he indicates that there will be a good possibility to resume the count some 30 minutes or so from this time. We'll be standing by for further reports as we await continuing reports from the weather plane. The clouds here extend up to about 18,000 feet and we are getting some rain in the complex 38 area at this time. 8 minutes and 2 seconds and holding on the clock for Apollo 14. This is Kennedy Launch Control.

END OF TAPE

PAO This is Kennedy Launch Control. We remain in our hold at T minus 8 minutes and 2 seconds on the clock. The Apollo 14 Flight Crew, Astronauts Alan Shepard, Stu Roosa and Ed Mitchell have been advised of our situation and they acknowledge the information and they've basically been resting back in the spacecraft. We have not heard any reports from them lately. However, the spacecraft has conductors, Skip Chauvin is keeping them updated on the weather information. They have been told, as we have been told, here in the firing room that the conditions could possibly improve in some 20 to 30 minutes and there does appear to be a clear area behind this present large cloud shell that is passing over complex 39 at this time. That's our status. We remain in a hold at 8 minutes and 2 seconds. This is Kennedy Launch Control.

END OF TAPE

SPEAKER This is Kennedy Launch Control remaining in the HOLD - T minus 8 minutes and 2 seconds at this time on Apollo 14. We're standing by for further advisory from the National Weather Service Aircraft which is surveying the cloud conditions in the area. Just a matter of a minute or two ago, the Director of Flight Crew Operations Deke Slayton called in to Al Shepard in the spacecraft and mentioned to Al that at least it's more comfortable up there than it was in the old days. Al reported back, "Oh, my yes." He also added to Deke that we're in good shape up here. We're standing by for further reports. HOLDING 8 minutes and 2 seconds. This is Kennedy Launch Control.

END OF TAPE

PAO This is Kennedy Launch Control. Still in the hold T minus 8 minutes and 2 seconds in our Apollo 14 countdown. We're still standing by for further reports from the weather plane. Indications are about the same as reported earlier. From 10 minutes or 15 minutes this time has extended a little bit as we have remained in the hold. However, we are still being told that we expect that this cloud cover will clear the area. Obviously, when we do resume the count, as hopefully we will, a new asimuth update must be given to the astronauts to be placed in the computer for the flight. We were planning to fly on a 72 degree flight launch azimuth had we gone at the described time of 3:23 PM EST. This azimuth will increase as the result of - we're standing by. We've just been informed here in the firing - we expect to pick up our countdown in 5 minutes from this time. Just as this announcement was being made, we have been alerted by launch director, Walt Kapryan. He has now given the go ahead to resume the countdown in 5 minutes from this time. We remain at 8 minutes an 2 seconds and holding on the clock. This is Kennedy Launch Control.

END OF TAPE

PAO This is Kennedy Launch Control. We're in our hold 8 minutes 2 seconds, but planning to resume the countdown several minutes from this time. From the latest advisories from the weather aircraft, it appears that the higher altitude clouds will have cleared the area by our now new planned launch time. We still will be launching through some cloud cover, but the top of these clouds will be 10 000 feet or less. This is the latest forcast we have from our weather advisory by the aircraft. We're at t minus 8 minutes and 2 seconds and holding, but planning to resume the count in several minutes. This is Kennedy Launch Control.

END OF TAPE

PAO This is Kennedy Launch Control, and our hold at 8 minutes and 2 seconds and holding. We have had a change of several minutes on resuming the countdown. The launch team has now been advised by the launch director - we will resume the count at 55 minutes past the hour, which is some 7 minutes from this time. We'll be standing by expecting to resume the count in some 7 minutes from this point. 8 minutes and 2 seconds and holding, this is Kennedy Launch Control.

END OF TAPE

PAO This is Kennedy Launch Control, Apollo 14 countdown holding at 8 minutes and 2 seconds, but expecting to resume the count 5 minutes from this time. The launch team has been advised here in the firing room, and the spacecraft team back at the Man Spacecraft operations building conducting the spacecraft portion of the countdown. The astronauts on board of course also have been alerted. They just came back with a roger reply. This information we have been receiving concerning our cloud cover has been provided by a research flight facility aircraft of the national oceanic and atmospheric administration. This aircraft has been flying in the area as support for the Apollo 14 mission. 8 minutes 2 seconds and holding, this is Kennedy Launch Control.

END OF TAPE.

PAO This is Kennedy Launch Control. Still in our HOLD at 8 minutes and 2 seconds by the clock. Test Supervisor, Chuck Henschel has just pulled some of the key elements involved in the countdown. The question of GO status to pick up the count in about a minute and a half from this time. They all report READY and we are standing by. Expecting now to resume the count in a little less than one and a half minutes, this is Kennedy Launch Control.

END OF TAPE

PAO This is Kennedy Launch Control. Mark, we have resumed our countdown T minus 8 minutes and counting on Apollo 14. We're still keeping a close eye on our weather conditions at this time but launch director Walter Kapryan has made the determination to resume the count. This should put us with a lift off at 3 minutes past the hour if all continues to go well. We are now starting the chill down of the engine chambers on the third and second stages of the Saturn 5 launch vehicle. This is one of the critical elements, and has to do with hold time. The chill down has to last a precise period. We feed in extremely cold helium into the engine chambers of both the second stage and third stage to condition them for the very cold liquid oxygen and liquid hydrogen that will be flowing into the chamber when they're due to ignite later during the powered portion of the flight. All is still going well as far as launch vehicle, spacecraft and the three astronauts on board. Coming up to the 7 minute mark, mark. Seven minutes and counting. This is Kennedy Launch Control.

END OF TAPE

PAO This is Kennedy Launch Control. T minus 6 minutes and counting. T minus 6. We're still proceeding at this time. We'll be standing by for the spacecraft ready lights to come on shortly from the spacecraft test conductor to show that both the command module, Kittyhawk and the lunar module, Antares are Go for launch. A status report will be coming up shortly to get a Go from all elements in the countdown. At the 3 minute, 7 second mark in the count we will go on an automatic sequence with the computer that will lead up to the ignition sequence of the 5 engines in the first stage of the Saturn 5 beginning at the 8.9 second mark in the count. All engines should be running at the 2 second mark and we should get a commit and a lift off at the 0 mark in the count. We're coming up now on the 5 minute mark in the count. The launch director has just given a Go to continue the countdown. Mark T minus 5 minutes and counting. We are Go with Apollo 14. This is Kennedy Launch Control.

END OF TAPE

PAO This is Kennedy Launch Control at minus 4 minutes and counting on Apollo 14. We are go with the mission at this time. Spacecraft conductor Skip Chauvin, polled the key elements, as far as spacecraft operations are concerned, and received a go all the way down, including 3 strong goes from the 3 pilots onboard the spacecraft. The aboard engine lights now have come on as cue lights for Astronaut Alan Shepard, on the lefthand side as we come up on 3 minutes and 30 seconds, 3 minutes 30 seconds and counting, and the Launch Operations Manager now has told Alan Shepard, we are go and on behalf of the launch team, wishes him Gods speed. Alan Shepard came back and said "Thank you very much, we'll give it a good ride." 3 minutes 15 seconds and counting. We'll be coming up on the automatic sequence shortly. Mark, we have 1 sequence start, the automatic sequence is in coming up on 3 minutes, T minus 3 minutes and counting. We are still Go at this time with Apollo 14. Skip Chauvin has just asked Lunar Module Pilot, Ed Mitchell to bring the tape recorder onboard the spacecraft. We're at 2 minutes 46 seconds and counting. As we're on the automatic sequence, the various tanks in the Saturn V launch vehicle, those propellant tanks in all 3 stages, begin pressurizing so that the propellants can be forced in the engine chambers at the appropriate time. Coming up 2 minutes 30 seconds and counting. Shepard has been alerted that he will be making his final guidance check shortly. Second stage launch tank beginning to pressurize in 2 minutes and 20 seconds and counting. Still go at this time. 2 minutes 10 seconds. We are still Go. We have taken the environmental control system off external. We have gone internal with the environmental controls of spacecraft. 2 minutes and counting. We are still Go. The tanks in the Saturn V still continuing to pressurize. The sequence for the ignition of those 5 engines in the first stage of the Saturn V begin at 8.9 seconds. We're now 1 minute 45 seconds and counting. Still Go with Apollo 14. We'll go on internal power in the Saturn V Launch Vehicle at the 50 second mark in the count. At ignition and liftoff we'll have more than 7-1/2 million pounds of thrust pushing the space vehicle off the launch pad. This is the heaviest Saturn V space vehicle to be launched thus far. Coming up from the 1 minute 20 second mark. 1 minute 20 seconds and counting - still Go at this time. Third stage tanks now are pressurized according to our status board here in the firing room. 1 minute 10 seconds and counting. This is Kennedy Launch Control, coming up in 60 seconds, mark T minus

END OF TAPE

SPEAKER 60 seconds, MARK. T minus 60 seconds and counting. Still GO with the count. First stage, tanks are now pressurized says our status board give us a rundown on the automatic sequence. 50 seconds and counting. We've now gone on internal power - on the internal batteries of the Saturn V as the count continues. 40 seconds and counting. Alan Shepard reports that he's performing his final guidance alignement. The final maneuver the astronauts perform before liftoff. 30 seconds and counting. Stu Roosa just said "Thanks. It's been a good count." 25 seconds and counting. We are still GO. 20 seconds - Guidance alert. The Guidance system now going internal. 15, 14, 13, 12, 11, 10, 9, 8 - initial sequence start. 5, 4, 3, 2, 1, 0. Launch commit. LIFTOFF. We have lift off with Apollo 14, 3 minutes past the hour. The tower is clear.

PAO Houston is controlling.

SC I've got thrust in all 5 engines.

PAO 16 seconds, pitch and roll programs started. 14 maneuvering to a proper flight course. 25 seconds.

SC Okay Houston. Roll complete.

CAPCOM Roger. Roll complete.

PAO Shepard reports all program completed. Pitch profiles still in progress. 37 seconds.

SC Standby for note one BRAVO. Mark 1 BRAVO now.

CAPCOM Okay, we've one BRAVO.

PAO CAPCOM Gordon Fullerton making that report.

PAO MARK 1 minute.

CAPCOM Cabin pressure coming down adjusting from sea level to a space environment. A status check in Mission Control coming up all green on the Flight Director's console.

CAPCOM 14, Houston. Everything looks good here on the ground.

SC Rog.

PAO One minute, 19 seconds coming up on period of maximum aero dynamic pressure on the vehicle. One minute, 35 seconds and 9 nautical miles in altitude, 5 nautical miles downrange. The velocity now reading 3340 feet per second.

CAPCOM Pass through max skip.
SC Load one, Charlie.
CC Mark one Charlie now.
SC Rear one EVS autos OFF.
CAPCOM Roger.
PAO Two minutes five seconds coming up on center engine shutdown.
PAO Two minutes 12 seconds, 20 nautical miles in altitude.
SC Inboard cut off.
CAPCOM Roger. Inboard. Center engine shutdown on time. Two minutes, 25 seconds 25 nautical miles in altitude, 30 nautical miles downrange. MARK 2 minutes, 35 seconds coming up on staging.
SC Shut off.
CAPCOM Roger.
SC And separation.
CAPCOM Roger.
SC Ignition on 5.
CAPCOM Roger.
CAPCOM At staging on the Shepard crew now riding on 5 good second stage engines.
SC On 5 engines.
CAPCOM Roger. We confirm good thrust and on 5.
PAO The giant first stage falling away now. It's day's work done. Three minutes, 10 seconds coming up on skirt sep and tower jettison.
SC Skirt SEP.
CAPCOM Roger.
SC There goes the tower.
CAPCOM Roger. We confirm.
PAO The launch escape tower has ejected on time.
SC Depress press and water level.
CAPCOM Roger Ed.
PAO Three minutes 35 seconds 14 now 33 feet shorter 9000 lbs. lighter moving out well beyond the earth's atmosphere. We show an altitude of 16 nautical miles. Mark 3 minutes, 55 seconds 63 nautical miles in altitude. 143 nautical miles downrange. Velocity now -
SC At 4 minutes trajectory and guidance looks good.
SC 14, Roger.
CAPCOM 14, Houston. The CMC is GO.
SC Roger, CMC GO.

PAO Four minutes, 20 seconds, velocity now reading 10 750 feet per second and accelerating. In Mission Control, Apollo 14 trajectory data driving right down the middle of our block boards. Right now flight path data is GO.

PAO Coming up on five minutes, 78 nautical miles in altitude, 235 nautical miles downrange.

PAO Retrofire also reports there - 14 is clear of the Atlantic weather.

PAO Predicted time for S-2 shutdown 9 minutes 16 seconds. Very close to normal. We're at five minutes, 45 seconds.

SC Stand by for S-IVB to COI. Marks S-IVB to COI now.

SC S-IVB to COI.

CAPCOM Roger, and your times are nominal. Level sense on A plus 39 and S2 cut off at 9 plus 16.

SC (GARBLE)

PAO CAPCOM Gordon Fullerton reporting that 14 capable of reaching the minimum orbit. The combination of a good third stage and service module engines. Meanwhile in Mission Control status check being taken. Coming up all green. We're at 6 minutes 20 seconds of 1491 nautical miles -

SC All my motors are running.

CAPCOM Roger 14. Gimbal motors ON.

PAO Six minutes 30 seconds 93 nautical in altitude. 420 nautical miles downrange.

SC Stand by for S-IVB to orbit. Mark you have S-IVB to orbit now.

SC Roger. IV-B orbit.

PAO Shepard, Roosa and Mitchell now told that they can reach orbit. They're on booster power only after given a good third stage. Six minutes, 55 seconds 95 nautical miles in altitude. Seven minutes, 5 seconds and 499 nautical miles downrange. Velocity now reading 16 587 feet per second.

PAO Seven minutes, 30 seconds, 14 flying almost parallel over the ocean now with the Shepard crew in a hitched down position. Really moving out now for downrange distance so we show downrange of 587 nautical miles.

SC Inboard cut off.

CAPCOM Roger. Inboard.

PAO That was center engine shut down right on time. Good thrust on the other four.

PAO Eight minutes, 10 seconds of 14 now 98 nautical miles in altitude, 700 nautical miles downrange. Velocity now reading at 19 881 feet per second. Staging status - -

SC You go for staging.

CAPCOM CMC is GO.

SC Roger. CMC is GO.

CAPCOM We have level sense on now.

SC Roger. We will confirm.

PAO Mark 9 minutes 100 nautical miles in altitude, 830 nautical miles downrange.

CAPCOM Stand by for Mode 4 capability. Mark you have an out?

SC Roger. Mode 4.

PAO That Mode 4 call says a good -

CAPCOM Roger. Cut off.

SC And staging.

END OF TAPE

PAO Mark 9 minutes, 100 nautical miles in altitude, 830 nautical miles downrange.

CAPCOM Stand by for mode 4 capability. Mark you have it now.

SC Roger, mode 4.

PAO That mode 4 call says a good deal - -

CAPCOM Roger, cut off.

SC And staging.

CAPCOM Roger.

SC And good thrust on one.

CAPCOM Roger.

PAO 9 minutes 30 seconds. Thrust looks good on the S4B after staging.

CAPCOM Looks good on the S4B.

SC Thank you.

PAO The Shepard crew has now used up 2/3 of their Saturn stages on their way to orbit. We're at 9 minutes 45 seconds. 101 nautical miles in altitude. 989 nautical miles downrange. Velocity now reading at 22,300 - - 23,313 feet per second.

SC 14, Houston. Everything's looking perfect here.

CAPCOM Roger.

PAO 10 minutes, 25 seconds. 102 nautical miles in al - - altitude. 11,443 nautical miles downrange. Velocity now reading 24,206 feet per second.

CAPCOM 14, Houston. Predicting cutoff is as planned, 11 plus 43.

SC Roger.

PAO Predicted time of shutdown, 11 minutes, 43 seconds. We're now at 11 minutes, 10 seconds.

CAPCOM - Houston. Predicted cutoff is 11 plus 43 nominal. Over.

SC Rog. 11 plus 43.

PAO Downrange distance now at 1322 nautical miles. 11 minutes 30 seconds. Standing by now for shutdown.

SC We've got a good cutoff.

CAPCOM Roger.

PAO Shutdown. We'll stand by now for preliminary orbital readings both onboard and from the ground.

CAPCOM Apollo 14, Houston. The booster is safe and your orbit is Go.

SC Roger. Good show. Go orbit, booster is safe.

SC Boosting - power 2 coming on now.

CAPCOM 14, Houston. I have a Z torquing angle when you're ready to cut.

SC Okay. We're showing about 99 over 102.9.

SC Okay.

PAO This is Apollo Control, Houston. We're advised that the Vice President of the United States is now in the firing room. We'll switch to Cape Kennedy.

END OF TAPE

PAO This is Kennedy Launch Control. The Vice President of the United States and their royal highnesses, the Prince and Princess of Spain have now arrived in the firing room and are being introduced at this time to the Launch Director, Walter Kapryan. With him is Mr. George Low, the acting Director of the National Aeronautics and Space Administration.

SPEAKER Ladies and Gentlemen we are honored to have with us today, for the launch of Apollo 14 the Vice President and his royal highness Jaun Carlos, Prince of Spain. May I now present the Vice President of the United States.

AGNEW Thank you, thank you very much. Again I suppose that it is almost a routine performance for me to be here to congratulate the men and women of NASA on an incredibly successful launch and insertion into orbit. I must say, that I never fail to be tremendously impressed and moved by this occurrence. Today is especially pleasurable because I had the opportunity to be with their royal highnesses, Prince Juan Carlos, Princess Sophia of Spain, and I can tell you this much, if I have ever seen two fans and converts to the American space undertaking we have them right here in these wonderful foreign dignitaries with me today. I think that this flight, as an especially meaningful and critical mission in the American space program, I don't have to enlarge upon that to the men and women here. Our dedication to our space program remains undiminished. I think that we're going to continue to press forward for what needs to be done in this respect, and I want to congratulate the people of NASA who, through out all of the pullings and tuggings, the fears and the exhilirations that undertake a high risk venture such as the American space program, have been so consistent, so constant, and certainly, so restrained in their reaction to what may have been considered to be, in some areas some very discouraging occurrences. Those days are past us and we're going forward together, not just to the moon, but I'm certain that the American program will continue to press forward into the reaches of interplanetary space, and now it's a great pleasure for me to ask, our royal guest, his royal highness Prince Juan Carlos, who incidentally knows a lot more about flying than I do because he pilots his own helicopter, to greet the men and women of NASA, and to give us, in some measure his reaction to this historic occasion.

CARLOS Thank you. Thank you very much Mr. Vice President. You said that we were fans, we are fans. We came here in 1962 on our honeymoon. We met some of you that we saw today, we are very happy to see them again.

CARLOS We saw the installations and the facilities of NASA in Houston, when Doctor Low was there then, at the time, and we are very much interested. Personally I followed a few of the tracking stations you have in my country. I know the people there, and I know how well they are doing. Here I don't have any words because you are the men who put up those three men that now go to the moon, and you are doing so much for progress, and for the whole humanity, that I'm very proud to be a part of you today. Congratulations and thank you very much.

SPEAKER Thank you very much your royal highness. It is now my pleasure to introduce Doctor Kurt Debus, Director of the Kennedy Space Center.

DEBUS Thank you Charles. Your royal highness, as old timers in the manned program and specifically in the lunar program when you visited us it was just the beginning. Now we have proceeded with several missions to the moon and we will continue to do so. As a momento, as a rememberance to your visit I want you to have this little picture.

CARLOS Thank you very much.

END OF TAPE

PAO This is Apollo Control, Houston. Now at 22 minutes into the flight of Apollo 14. We're less than 2 minutes away now from loss of signal with Canary. Apollo 14 presently in a circular orbit of 102 nautical miles. At this time we will play back the tapes of our conversations with 14 just following our switch back to the Cape.

SC - - power 2 coming on now.

CAPCOM Okay. Houston. I have Z torquing angle when you're ready to copy.

SC Okay. We're showing about 99 above 102.9.

CAPCOM Roger.

SC Okay. Two seconds. Logic 2 off. Arming breakers coming open. JA3 V-max going to rate 2. Okay RCS logics off. Back to normal. (garble)

CAPCOM Apollo 14, Houston. The Saturn is configured for orbit. We're showing you in a 102 circular orbit.

SC Got us in a 102 circular.

SC Okay, Gordon. I'll take the Z torquing angle.

CAPCOM (garble) Z torquing angle is a plus decimal 14. Over.

SC Plus 0.14.

CAPCOM Roger.

CAPCOM 14, Houston. You have 45 seconds to Vanguard LOS - to Canary.

SC Roger, Houston.

CAPCOM Apollo 14, Houston. How do you read clear Canary?

SC Loud and clear, Houston.

CAPCOM You're loud and clear.

14, Houston. About 45 seconds to LOS. We have nothing for you before Carnarvon. Over.

SC Roger. We're on the checklist.

CAPCOM Roger. See you in Carnarvon.

PAO This is Apollo Control, Houston. 25 minutes now since liftoff. We're out of acquisition range with Canary at this time. We expect to reacquire the spacecraft over Carnarvon in approximately 27 minutes. At 25 minutes into the flight of Apollo 14, this is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control Houston at 51 minutes now into the flight of Apollo 14. We have just acquired the Apollo 14 spacecraft through Carnarvon. We'll quickly pass on to you heart rates during liftoff on the command module pilot and lunar module pilot. Stu Roosa's -

CAPCOM - through Carnarvon. How do you read?

SC Read you loud and clear.

CAPCOM Roger. We're reading you a lot of background static.

SC Houston, are you ready for a IMU REFSMAT realign check, P52 numbers?

CAPCOM Roger, Ed. Go ahead.

SC That's NOUN 71, (garbled) 22 24 95 is all balls. NOUN 93, is 00085 plus 00010 plus 00166. DET at 38:15 and we just burst into sunlight, Gordo, it was quite a sunrise.

CAPCOM Roger, Ed. We copy that.

PAO This is Apollo Control Houston. During this lull in commuications we'll start again to pass along those heart rates at liftoff. That was a peak rate of 132 on command module pilot Stu Roosa. He averaged in the 120's during the boost phase of flight. In the case of Ed Mithcell his peak rate was 90 and ran in the 80's. Commander Alan Shepard we received no data on. We suspect a loose sensor or connector and this will be fixed sometime in orbit during the more quiet period. We presently show Apollo 14 in an orbit of 104 nautical miles by 101 nautical miles. We're at 54 minutes now into the flight. We'll stand by and continue to monitor.

PAO This is Apollo Control Houston now at 58 minutes into the flight of Apollo 14, continuing here with a lull in ground conversation. At this time I'll pass along the shutdown times on the Saturn as it achieved its orbit: S-IC shutdown or cutoff was 2 minute 44 seconds; S-II shutdown was copied at 9 minutes 19 seconds, this 3 seconds longer than nominal, and the S-IVB shutdown or cutoff was at 11 minutes 40 seconds instead of a preflight 11 minutes 43 seconds. We're at 59 minutes now into the flight of Apollo 14 and continuing to monitor, this is Apollo Control in Houston.

PAO Apollo Control Houston, 1 hour now into the flight of Apollo 14. We've had LOS with Carnarvon, we expect to acquire Honeysuckle momentarily. At 1 hour into the flight, this is Apollo Control Houston.

CAPCOM Apollo 14, through Honeysuckle. Over.

CAPCOM Apollo 14, Houston, through Honeysuckle. If you read, go OMNI CHARLIE.

PAO This is Apollo Control Houston, 1 hour 6 minutes now into the flight. We've had loss of signal with Honeysuckle. We presently show 14 in an orbit of 106 nautical miles by 100 nautical miles at a velocity reading of 25 583 feet per second. At this time we'll switch to the Cape for the post-flight press conference. Switching now to the Cape.

KING Are the lights on? Okay, I guess -

END OF TAPE

PAO This is Apollo Control Houston at 1 hour 30 minutes now since the liftoff of Apollo 14. We presently show 14 less than a minute now away from acquisition with an orbit of 106 by 101 nautical miles. The preliminary look at our translunar injection time puts it at a time of 2 hours 28 minutes 27 seconds.

SC Houston, we've completed our checklist of (garbled).

CAPCOM 14, Houston. Say ahead. Pretty bad static right in the middle of that transmission. Will you say again?

SC Roger, Houston. We have completed our L to 18.

CAPCOM Roger.

SC Houston, we're starting to extend the docking probe now.

CAPCOM Roger, Ed, and I have a TLI plus 90 pad any time you're ready to copy.

SC Roger. One second and we'll be ready for you.

SC Okay, Houston, the probe's extended.

SC Houston, I'm ready to copy.

CAPCOM Okay Ed. One question from Dr. Gilruth. They are wondering how you all like zero-g.

SC Say again, Houston.

CAPCOM Dr. Gilruth was wondering how you like to fly - how you like flight in zero-g -

SC I think I got that one, Gordon. You're asking about zero-g and it's really great. Everybody's in great shape, we're having a ball, way ahead of the time line.

CAPCOM Roger. I'll go ahead with TLI plus 90, Ed, if you're ready.

SC Go ahead.

CAPCOM Okay, it's a TLI plus 90, SPS/G&N. NOUN 47 64470 minus 145 plus 130. TIG is 003 59 5113. NOUN 81 minus 05158 plus all balls plus 84206. Attitude 181 256 001. HA is NA. HP plus 00171 84364 901 84049. Sextant 15 2214 399. Boresight star is NA. NOUN 61 minus 3014 minus 02500 11544 33721 GET for 05G 012 - correction. 010 5729. GDC aline set stars are Sirius and Rigel 333 083 013 no ullage. Go ahead.

SC Roger, Houston. That COMM wasn't too good. I missed burn time, trunnion angle, and - will you repeat those two.

CAPCOM Roger. Your burn time is 901 and trunnion angle, 399. Over.

SC Roger, and say again the burn time.

CAPCOM Burn time 901, 901. Over.

SC Roger, 901. TLI plus 90, SPS G&N 64470 minus 145 plus 130 at 003 59 5113. 5158 plus all zeros plus 84206 181 256 001 NA plus 00171 84364 901 84049 152214 299 NA NOUN 61 minus 3014 minus 02500 11544 33721 GET of 05g: 010 5729 Sirius Rigel 332082013 no ullage.

CAPCOM Okay, Ed. I have about 4 corrections. The first is on DELTA-V X on NOUN 81. I missed your readback on that. It should be minus 05158. Is that what you got?

SC That's affirm,05158.

CAPCOM Okay, and a couple of readbacks were incorrect. Trunnion angle is 399, 399. Over.

SC Roger, trunnion 399.

CAPCOM And our alines, or the GDC aline, that is 333 and pitch is 083. Yaw you read back correctly, 013. Over.

SC Roger, 333 083 and you're coming in very loud and clear now, Gordon.

CAPCOM Okay, Ed. You've been loud and clear. I'll give you the P37 for liftoff plus 8, if you're ready.

SC Go ahead.

CAPCOM Okay, GET of ignition is 00800 3283 minus 165 and GET for 400 K, 04538. Go ahead.

SC That's 00800 3283 minus 165 and 04538.

CAPCOM Roger, your readback is correct and I have the TLI pad.

SC Okay, these pads are sure wrecking my viewing, but all right.

SC Okay, Houston, go ahead with the TLI pad.

CAPCOM 14, Houston. Before the pad would you give us POO and ACCEPT for a new state vector.

SC Okay, you have it.

CAPCOM And I'm ready with the TLI pad.

SC Go ahead.

CAPCOM Roger, time base 6 predict 21851. Attitude for TLI 179 136 000. Burn time 552 103630 35549. SEP attitude 359168 319. Extension attitude 301 348 -

END OF TAPE

CAPCOM extraction altitude 301, 348, 041. Ejection time is 35600. Go ahead.

SC Okay. I have 021851. I missed the angles. Run time 5 plus 52. 10363035549, 359, 168, 319, 301, 348, 041. Ejection 35600. And would you give me the angles again, please?

CAPCOM Roger, Al. Your readback was correct. The TLI attitude is 179, 136, 000. Go ahead.

SC I have 179, 136, 000.

CAPCOM Roger. Read back correct.

CAPCOM Apollo 14, Houston. The computer is yours. We're through with the uplink.

SC Okay. Thank you. Okay, Houston. We're going to stand by for your Go for pyro arm.

CAPCOM Roger, Al. Stand by. You're Go for pyro arm.

SC Okay, Houston. Your logic switches on?

CAPCOM Roger. Now you're go for pyro arm.

SC Thank you.

CAPCOM Apollo 14, Houston.

SC Go ahead.

CAPCOM We have about 4 minutes to LOS vanguard, Ed. And due to the launch delay, the Canary plans will be pretty low elevation marginal, at the most about 2 minutes long.

SC Okay. Thank you.

CAPCOM Apollo 14, Houston.

SC Go ahead.

CAPCOM We're reading the CDR's EKG loud and clear now. We're wondering if you did anything to fix it up there.

SC No.

CAPCOM Roger.
It looks good.

PAO Apollo Control, Houston. One hour, 47 minutes now into the flight. You heard the translunar injection pad being passed to the crew. We're presently looking at a time of ignition of 2 hours and 28 minutes, 29 seconds. A Delta-V on the burn of 10,367 feet per second. Burn duration of 5 minutes, 52 seconds. Velocity at time of shutdown 35,549 feet per second. As you heard CAPCOM Fullerton pass along, apparently we are receiving medical data from the commander at this time. We're at one hour 48 minutes into the flight of Apollo 14. This is Apollo Control, Houston. Apollo Control, Houston. One hour, 50 minutes now into the flight. We - -

CAPCOM Houston?

SC Go ahead.

CAPCOM We're real close to LOS, so I'll go

CAPCOM ahead and give you the words I've got about TLI. First of all, the - the monitor angles on page L2-24 should all be increased by 2.5 degrees. And as you're monitoring the TLI burn with the q-cards, the pitch angle should all be reading about 9 degrees higher than on the card. The yaw should be within a quarter of the degree, 1/4 degree of what the card reads. Did you copy? Over.

PAO Apollo Control, Houston. One hour, 51 minutes. Apparently we had loss of signal with 14 just about the time CAPCOM Fullerton was passing along that new data. We repeat, we show a time of ignition for TLI of 2 hours, 28 minutes, 29 seconds. A delta velocity of or Delta-V of 10,367 feet per second. A burn duration of 5 minutes, 52 seconds and a velocity of time of shutdown of 35, 549 feet per second. Reacquiring with Canary.

CAPCOM In Houston through Canary. Over.

SC Okay, Houston. We got nothing of your last transmission. (garble).

CAPCOM Okay. I'll start over. For the TLI coming up on your monitor, first of all on the q-card, the yaw angle as shown are okay. The pitch that you see on the ball should be 9 degrees higher all the way through the burn than as shown on the q-card. Just add 9 to all your pitch angles and that should be good. On the ordeal angles that is shown on pages 2-24 and 25 increase each of those by 2 1/2 degrees. At 57 minutes instead of 18 you should have 20.5 degrees. At 59 minutes, 12.5 and at 59:55, 8.5 degrees. Over.

SC Roger. Understand that the yaw angles are okay. Pitch should be - angle should be plus 9 degrees and ORDEAL angles increaded by 2.5 degrees.

CAPCOM Roger. That pitch is a 9 degree increment over what is shown on the card. In other words, all the angles should be 9 degrees higher than as shown on the card. The inertial angles. Over.

SC Rog, Gordon - we got that - -

CAPCOM 14, Houston.

SC Go ahead.

CAPCOM On your P15 we show that you loaded the wrong seconds figure for time base 6. Will you check that?

SC Thank you, Gordon. Good call.

CAPCOM 14, Houston.

SC Go ahead.

CAPCOM For that time to take, you're going to have to reselect P15.

SC Rog. I - did, Gordon. We'll run through it again.

CAPCOM Roger.

PAO P15 is the Saturn time base 6 initiation program. This is Apollo Control, Houston.

PAO One hour and 55 minutes. We had loss of signal with Canary's. Meanwhile the countdown clocks in Mission Control show a LOS time of 11 minutes for the command module. This is ARIA or an Apollo Range and Instrumentation Aircraft acquisition and we're counting down now for time of ignition. Presently showing 32 minutes, 40 seconds away from time of ignition. We're at one hour, 56 minutes into the flight continuing to monitor. This is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control, Houston, at 2 hours 4 minutes now into the flight of Apollo 14. We presently show 14 in an orbit of 106.2 nautical miles by 102.4 nautical miles. Our latest update on the translunar injection burn shows a time of ignition of 2 hours 28 minutes 30 seconds, a DELTA-V of 10 366.5 feet per second, burn duration of 5 minutes 52 seconds, predicted velocity at time of shutdown 35 551.8 feet per second, and altitude at time of cutoff of 173 nautical miles. The GO NO/GO callup for TLI will be made after acquisition at Carnarvon, although we will have voice communications with Apollo 14 through ARIA we will lose station acquisition in about 2 minues into the burn and will not be able to read onboard data. However, the crew of Apollo 14 will pass a burn status report at the end of burn and what they will be reading will be from their DSKY. They will pass along the velocity at time of shutdown, altitude at time of shutdown, and H dot or altitude change at time of shutdown. The translunar injection burn will be done along the local horizontal. We're at 2 hours 6 minutes into the flight of Apollo 14 and we'll stand by until we acquire the spacecraft. This is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control, Houston, at 2 hours 16 minutes now into the flight of Apollo 14. We'll stand by for any communications with the ARIA aircraft. We're 12 minutes 25 seconds away from time of ignition.

CAPCOM Apollo 14, this is Houston through ARIA 4, how do you read?

SC Houston, this is Apollo 14, loud and clear, how read?

CAPCOM You're readable, a little background noise, but not unreadable.

SC Roger, Houston.

PAO That was Ed Mitchell responding aboard the spacecraft.

SC Houston, 14, how do you read now?

CAPCOM Apollo 14, Houston, you're readable.

SC Okay, I was just checking the com out. Hey, you're just beautiful, ARIA is really putting out for us.

PAO 2 minutes 18 seconds, that was Stu Roosa coming in with a comment.

PAO We're ten minutes away now, from time of ignition.

SC (garble). (garble)

PAO Nine minutes away now.

CAPCOM Apollo 14, Houston, over.

SC Go ahead.

CAPCOM Roger we missed if you did call time base 6 starting, and we'd like to know how the tank pressures look, over.

SC Okay it looked to us like time base Charlie we didn't want a second nominal time, and the oxidizer tank is currently - auietly at 3 7 and the (garbled) tank is currently setting quietly at 2 6.

CAPCOM Roger that.

PAO That was Alan Shepard responding to that call. We're at 2 hours 22 minutes now. 6 minutes 25 seconds away from time of ignition.

CAPCOM Apollo 14, Houston, over.

PAO Four minutes away now from time of ignition.

CAPCOM 14, Houston, How do you read?

PAO We now are receiving Carnarvon data, and very shortly flight director Pete Frank will poll this flight control team as to our status for TLI.

SC Okay, Houston, 14. How do you read us?

CAPCOM Roger 14, this is Houston, through Carnarvon, and you're loud and clear.

SC You're 5 square.

PAO 2 minutes 20 - 2 hours 26 minutes. Pete Frank now taking a status check with his flight control team. Coming up all green.

END OF TAPE

PAO 2 minutes, 2 - or 2 hours, 26 minutes. Pete Frank now taking a status check with his flight control team. Coming up all greens.

CAPCOM Apollo 14, Houston.

SC Go ahead.

CAPCOM You're GO for the Moon. Go for TLI.

SC Roger. Go for TLI.

PAO That was Al Shepard responding to that GO for TLI. We're at 2 hours, 27 minutes now into the flight. One minute, 32 seconds from time of ignition. Less than 30 seconds now from time of ignition. Our displays show a predicted apogee resulting from this burn of a 250,263.7 nautical miles. We're at 2 hours, 28 minutes now into the flight. Standing by.

SC We have ignition.

CAPCOM Roger, ignition.

SC Smooth start. Steering is good.

CAPCOM Roger. We show good thrust on the S4B.

PAO That's Al Shepard, spacecraft commander giving that report. Booster says we look good at 1 minute 3 seconds into the burn. Flight dynamics is pleased with the agreement between his data. We show a velocity buildup on one of our displays presently reading 27,390 feet per second. Coming up now on 2 minutes.

SC Houston. Tank pressures are steady in 40 and 30.

CAPCOM 14, Houston. Roger.

PAO Al Shepard again aboard the spacecraft. Thrust data looks good. Still receiving data showing the velocity of 29,212 feet per second. 3 minutes, 10 seconds now into the burn. Coming up now on 4 minutes, 4 minutes. We've had LOS with Canarvon. Our network reports we're receiving IU data through Guam. Looks good. Apollo 14 tracking right down the middle of our plot boards in Mission Control. 5 minutes, 10 seconds.

CAPCOM 14, Houston. Through (garble) 2. Over.

PAO Booster says 20 seconds to GO.

SC - - are cut off.

CAPCOM Roger, 14. Cut off.

PAO That was Allen Shepard reporting shutdown. It looks like - -

SC - - coming down through 35 now. The (garble) coming down through 30.

CAPCOM Apollo 14, roger.

PAO Apollo Control, Houston. That shutdown time appeared to be right on time.

CAPCOM 14, Houston. Go ahead.

SC Reading a VI plus 35542. Delta-V C minus 8.8. (garble) 4399. (garble).

CAPCOM 14, this is Houston. We copy VI plus 35542, Delta-V C of minus 8.8, and what's the last two? Would you repeat?

SC Okay. (garble) plus 04399. Altitude plus 01747.

CAPCOM Roger. Plus 04399 and plus 01747.

SC Okay. I'm not sure I got your (garble) plus 04399.

CAPCOM Roger. 04399.

PAO With that report, flight dynamics officer Dave Reed says that it looks like a good burn. We're at 2 hours 37 minutes now into the flight. We'll stand by and continue to monitor.

SC Houston. On the (garble)

CAPCOM Roger. I understand, 18 and 17 on the tank pressures.

CAPCOM Apollo 14, Houston through Guam. Over.

SC Go ahead, Houston. Say again.

CAPCOM You're loud and clear, Ed. And we should have continuous voice and data from here on out. You're loud and clear from Guam.

SC Okay, Gordon. We have your signals - have good signals strength from you now and I might say here that the earth is starting to drop away rapidly at this point.

CAPCOM Roger.

SC Stu and Al have started to change seats. We're going into our pre-sep checklist.

CAPCOM Roger.

CAPCOM Apollo 14, Houston. I have an update to your high gain and gimbal angles as shown on page 3-3 when you're ready.

SC Okay. Go ahead.

CAPCOM Okay, about 5 lines from the bottom this is the high gain angles after pitch around for docking, it should be a pitch plus 11 and yaw plus 306.

SC Understand pitch plus 11 and yaw plus 3 - plus 306.

CAPCOM Roger. That's right.

PAO This is Apollo Control, Houston at 2 hours, 43 minutes into the flight of Apollo 14. The booster has advised the Flight Director that the maneuver to separation attitude should begin at 2 hours - -

END OF TAPE

PAO Minutes into the flight of Apollo 14. The booster has advised our flight director that the maneuver to separation attitude should begin at 2 hours 49 minutes 23 seconds. About 3 minutes, the time duration for the maneuver separation, we're now looking at 2 hours 59 minutes 23 seconds. We'll stand by and continue to monitor. This is Apollo control Houston.

CAPCOM Apollo 14, Houston. I have some update for your, for you now, over.

SC What type of updates?

CAPCOM I've got the S4B maneuver time and SEP time that goes on 3 dash 1, and then a new S4B viewing attitude.

SC Roger, I'm ready to copy.

CAPCOM The S4B maneuver time, 2 4 9 23, maneuver will be complete in 3 minutes, and the nominal SEP time is 25923.

SC Understand S4B maneuver 24923 and it'll maneuver for 3 minutes. SEP is 25925, and 23.

CAPCOM That's correct, Ed. And then on page 3-7, stand by 1. 14, Houston.

SC Go ahead.

CAPCOM Terminate the cabin repressurization. We show you over 6 psi.

SC We beat you to it.

CAPCOM Okay, now you have a 3.7 in front of you. I'll give you the new S4B zero attitude now 22 angle.

SC Okay, go ahead.

CAPCOM Okay, it's about a quarter of the way down where it reads 93 39.6 and 355.8. Change them to read, roll is the same, 090 pitch plus 349.0, and yaw plus 356.0.

SC Roger, you said, Roll is the same, pitch is 349.0, yaw is 356.0.

CAPCOM Roger, read back is correct.

CAPCOM Apollo 14, Houston. Give us on the Charlie please.

SC Houston, do you have Charlie?

CAPCOM Roger.

PAO Apollo 14 now 27 hundred 44 nautical miles away from the earth. We're up to 2 hours 53 minutes into the flight. 2 hours 54 minutes, our booster reports maneuvering to seperation attitude has been completed. 2 hours 55 minutes, and Mission Control Flight Director, Pete Frank taking a status check for transposition docking.

SC Houston, 14, the S4B tank pressures oxidizer 24 and fuel 9.

CAPCOM Roger, oxidizer at 24, fuel 9.

PAO We now show 14 at an altitude of 3126

PAO nautical miles. Apollo Control Houston, 14 now 33 hundred 69 nautical miles, 34 hundred and 4 nautical miles at 2 hours 57 minutes.

CAPCOM Apollo 14, Houston.

SC Go ahead Houston, 14.

CAPCOM Roger, you are go for transposition and docking, and we're to have a sight handover from Guam to Goldstone at 3 hours even, over.

SC Okay, understand, we're going to Goldstone at 3, and we have a go for T and D.

CAPCOM That's affirmative.

PAO We presently show 14 at a distance of 38 hundred and 58 nautical miles over earth. 3 hours -

SC ... go for power arm.

CAPCOM 14 Houston, you're go for power arm.

SC Okay.

PAO Standing by for a report of separation. Our data shows that we have separation. We're at 3 hours 3 minutes.

SC Okay, Houston, we have separated, turned around and started.

CAPCOM Roger.

SC Houston, 14.

CAPCOM Go ahead, Ed.

SC You should have the television in a minute, there it comes.

CAPCOM Roger, we're not seeing it yet.

PAO Ed Mitchell reporting, the television should be coming through. We're receiving an image now.

CAPCOM We're getting a gray picture now.

SC Okay.

CAPCOM We can see the drogue down toward the bottom of the picture and slightly -

END OF TAPE

SC Okay.

CAPCOM Drogue down toward the bottom of the picture and slightly left, you might move the camera a little bit left and then down about a half a frame.

CAPCOM That's real good. Right there.

SC Houston. How's the television look to you now. Do you think I (garble) the picture?

CAPCOM No. I wouldn't change a thing, Ed. Looks really good.

CAPCOM It's right in the middle and steady.

SC Okay.

PAO 14 now 51 068 nautical miles away from earth.

CAPCOM Apollo 14, Houston.

SC Go ahead.

CAPCOM Just for your information, we've lost data with the LVDC. We don't have any procedures for you. What have you got for that?

SC Say again, Houston.

CAPCOM We've lost data with - all data from the LVDC but we have no change in the figures. Go ahead with normal procedures.

SC Okay.

PAO That's the launch vehicle digital computer, the LVDC. We're at 3 hours, 9 minutes now into the flight.

PAO We're at 3 hours, 9 minutes on 14. Presently 5441 nautical miles away from earth.

PAO You see Kitty Hawk moving in before docking now. We're at 3 hours, 10 minutes into the flight. We show an altitude of 5577 nautical miles.

SC Houston, 14. Do you need any commentary to help you identify what you see on TV?

CAPCOM We're picking out things pretty well here. If you have anything for the rest of the country you might go ahead and talk. It won't interfere with the operation we're at.

SC Okay. I'll chat for a minute. The S-IVB is surrounded here by typical (garble) of millions of particles that came off when we separated and look like little old twinkling stars floating around in very rampant pattern. The sunlight is shining very strongly off the top of the lunar module as we drift into it. (garble) Excellent job of sliding in here very slowly. As you can see that are - approach the (garble) few tips of a foot per

SC second probably. And the LM is starting to get very large in our field of view. Hard to cover the width though up there plus that window. And the LM, the S-IVB are focused right out our X-axis. I couldn't tell you all of the -

SC Bright red.

SC Orange, yellow. Thermal protection around the LM. The parts that are black, silver and white. The colors stand out very nicely. And I can look across - across Stewart.

CAPCOM Hi Ed. This is Houston. About how far out in range and distance estimate.

SC About five feet.

CAPCOM Roger.

SC I'll stand by with the commentary here for a moment.

SC Go ahead, Houston. We're about to dock.

CAPCOM Roger.

PAO That was Ed Mitchell reporting they're getting ready to dock and we're at 3 hours 13 minutes now into the flight.

SC We're probably a foot - 18 inches to 2 foot out now.

CAPCOM Roger.

PAO We're at 3 hours 14 minutes into the flight. We show Apollo 14 at a distance of 6184 nautical miles.

SC And we docked.

CAPCOM Roger. We could see a slight oscillation.

PAO Ed Mitchell reporting that Apollo 14 Command Module, Kitty Hawk has docked in with the lunar module.

PAO We're at 3 hours, 14 minutes now into the flight. Apollo 14 presently at 6318 nautical miles away from earth.

END OF TAPE

SC Okay, Houston. We viewed it twice and sure looks like we're closing fast enough. I'm going to back back out here and try it again.

CC Roger.

SC We'd better back off and think about this one, Houston.

SC Roger, Ed.

SC We're unable to get a capture.

SC Roger, Ed.

PAO That's Stu Roosa and Ed Mitchell reporting that, at least at this point, that they're unable to get a capture. We'll stand by.

SC Houston, we're starting to drift back in now.

CC Roger, Ed.

CC Working, Houston

CC I would suggest that at the initial contact that you hold contacts for 3 seconds or so at least.

SC Okay, Houston. We tried it before, but not quite 3 seconds.

CC Okay.

SC That's better. A good rate coming in there.

SC And here we come in again.

CC Roger.

SC Okay, Houston. I hit it pretty good and held 4 seconds on contact and we did not latch.

CC Roger. We're seeing it all on TV here.

PAO You heard Stu Roosa. Still no latch. The crew has a period of time that they can continue with this attempt. The restricting item would be as long as we have attitude holding on the S4B.

END OF TAPE

PAO We're at 4 hours 25 minutes.

CC Apollo 14, Houston.

SC Go ahead, Houston.

CC The information is 3 plus 34 24, a nonpropulsive vent on the booster orbiting sequence, Don. We don't expect to see much on it.

SC Say that again please.

CC At 3 plus 34 24, a non propulsive vent in the booster orbiting sequence to open. Over.

SC Okay, we got it.

SC Okay, Houston, 14. I can look in the drogue and I can see 3 marks 120 degrees apart like the capture latches are scratching the drogue. They're about, oh I don't know, 1-1/2 long going into the hole in the drogue about - space about 120.

CC Roger.

CC 14, Houston. Can you describe the scratches? Are they sharp scratches or rounded off?

SC Well, I didn't really see that good. I can move back in, I guess. We can take a look at them. They look like fairly distinct scratches coming into the hole, but - let's move up, I'll take another look.

CC Roger.

PAO We're at 3 hours 29 minutes now into the flight. We show 1486 nautical miles into the flight.

SC Houston, 14.

CC Go ahead.

SC I,m sure you're all thinking along the same lines, but, you know if the capture latches were depressing as they slide into the drogue, I don't see why they would have made those marks.

CC Yes, that's been discussed here, and we think probably something is holding them out. One possibility is a sort of a hairpin that gets pulled out when the tower is jettisoned and first look at it we're thinking maybe that may not be - may not allow the capture latches to depress. I guess we'll just have to tell you to stand by while we talk it over here more.

SC Okay, we're nice and comfortable. And I'm just going to drift around here about this range and try not to use any more fuel then I have to.

CC Roger. A reminder, you have about 3 minutes till that vent will come open. Keep an eye on that booster when that happens.

SC Okay, how about you give me a mark on that duty?

CC Will do.

PAO This is Apollo Control Houston. They're 3 hours 32 minutes. That was Stu Roosa troubleshooting with the ground. As you have heard, 14 at this point

PAO has been unable to effect a capture in the docking procedure with the lunar module. We're at 3 hours 32 minutes continuing to monitor. We show Apollo 14 presently 91 050 nautical miles from earth.

PAO We're less then a minute now away from the time of non propulsive venting of the S4B.

CC 14, this is Houston. That vent is due in 40 seconds.

SC Okay.

SC 10 seconds

END OF TAPE

SC 10 seconds.

CAPCOM Ready mark, it should be on now.

SC Man, it's beautiful.

CAPCOM We can see one half of it from here.

SC Okay, I'll back down a little bit and let you watch this. There lightening up the whole sky. Of course it's the source of another 10 million particles floating out in front of us.

CAPCOM Roger.

SC I was going to say when we were kind of busy there a little while ago to look out our left window across Stewart we could see the earth receding.

CAPCOM Roger.

PAO This is Apollo Control, Houston, at 3 hours 39 minutes now into the flight of Apollo 14. Discussions continuing to take place here in Mission Control attempting to come up with a solution to -

SC Houston, we observe that the S4B is slowly rotating.

CAPCOM Roger.

PAO Apollo Control, Houston. 3 hours 40 minutes into the flight. Discussions are continuing in Mission Control concerning our docking problem. The -

CAPCOM I'm sorry, what happened.

SC Okay, I'm not sure what we might be doing to the windows, it gives us a minor problem at this point, but is everybody happy with us sitting here in this vent?

CAPCOM I don't think that point has been raised. Let me ask around here.

SC Okay.

PAO Apollo Control, Houston, the pacing item would be the attitude control on the S4B. The battery power is the major constraining item on that, however it does allow us a fair amount of time, approximately 6 to 8 hours. Continuing to monitor the trouble shooting operation here at Mission Control, this is Apollo Control, Houston. We presently show Apollo 14 at an altitude of 10 thousand, 6 hundred 33 nautical miles, and we're at a ground elapsed time of 3 hours 42 minutes.

PAO This is Apollo Control Houston. 3 hours 43 minutes into the flight. Trouble shooting continuing in Mission Control. To quickly repeat, we have been unable to latch with the lunar module. We have quite a while to consider an approach to this problem. The battery power on the S4B is perhaps a major constraining item, allowing us perhaps 6 to 8 hours of time. However, if we're not able to extract the lunar module, of course the Lunar Landing Mission would not be possible. We're at 3 hours 44 minutes continuing to monitor.

END OF TAPE

PAO minutes, continuing to monitor.

CAPCOM Apollo 14, Houston.

SC Go ahead.

CAPCOM While we're working on the problem here, we suggest that you go to a 5 degree deadband in the DAP, that will be a DAP load 11112 to save RCS and nobody's come up with a good suggestion on what to do about the windows, so I guess we just won't worry about it now.

SC Okay. Like I say, I think it's a minor problem.

PAO This is Apollo Control, Houston at 3 hours, 53 minutes now into the flight. We presently show 14 at al altitude of 12,310 nautical miles away from earth. To again go over our problem, the capture latches have not been working. One of the plans being considered here and will very probably be passed on to the crew is to retrack the probe and attempt to bypass the capture latches hoping to get the - to the docking latches. There are 12 docking latches and to successfully dock we would need 3 to work. If we are not able to extract the Lunar Module - I repeat our -

END OF TAPE

PAO extract the Lunar Module - I repeat our Lunar Landing Mission would not be possible. It is certainly a serious problem in terms of the mission itself, however, it is not that consideration in terms of crew safety at this time. We're at 3 hours, 54 minutes continuing to monitor. We show Apollo 14 at 12,481 nautical miles away from Earth and this is Apollo Control, Houston.

CAPCOM Apollo 14, Houston.

SC Go ahead.

CAPCOM I'd like you to try one thing. Take the - retract switch to retract and tell us what the talk back reads in retract cause you have in others before.

SC Okay, Gordon. You want the switch in retract and a readout of the talk back.

CAPCOM That's affirmative while the switch is in retract.

SC Rog. It's in retract now and the talk backs are great.

CAPCOM Roger.

CAPCOM Okay. That tells us right there that the capture latches are indeed cocked and that kind of says that there's something in there that's keeping us from releasing them when we go ahead and dock. And it says that we cannot firebottle. It just would not fire, is that the true indication? It would not fire. Right.

PAO This is Apollo Control, Houston, 4 hours now into the flight. We in Mission Control continuing to trouble-shoot our docking problem. The discussions still underway, both in the Mission Control room operation floor proper and with the span or the backroom experts. The capture latch has not been working. It is a problem which can be considered and discussed and played with for awhile. The constraining item would be the attitude on the third stage, the S4B and perhaps the most critical point there is the battery power and this approximate lifetime of some 6 to 8 hours. Again if we are not able to extract the Lunar Module the basic Lunar Landing Mission would not be possible and of course, an alteration - consideration of alternate missions would have to be made at that time. We're at 4 hours 2 minutes into the flight. We show 14 at al altitude of 13,523 nautical miles. This is Apollo Control, Houston.

END OF TAPE

CAPCOM 14, Houston.
SC Go ahead.
CAPCOM Another question. Can you remember back to the inital probe inspection, did you hear a thud as though it did extend out?
SC That affirmative, Gordon. I guess I should have mentioned that sooner. Yeah. We got the talk backs to our barberpole, then immediately back to gray. But we did feel the thud.
CAPCOM Roger, Stu.
PAO This is Apollo Control, Houston. 4 hours, 8 minutes into the flight. We show 14 at an altitude of 14 294 nautical miles away from earth. Discussions are continuing in the Mission Control Center concerning our docking problem. A probe and drogue model if it has not yet been brought in, will be brought in shortly to aid in the discussions. We show 4 hours 9 minutes into the flight continuing to monitor. This is Apollo Control, Houston.
SC Houston, 14.
CAPCOM 14, Houston. Go ahead.
SC Can we leave the television running or shall I take it down now?
CAPCOM Stand by.
CAPCOM Like to leave it running, Ed. We're not seeing that booster right now. It's in the lower left hand corner, just barely. But we'd like to keep it running for a future use.
SC Okay.
SC Houston, 14. And turning the PYROs and SEP logic OFF.
CAPCOM Roger.
PAO Apollo Control Houston. For - -

END OF TAPE

PAO Apollo Control Houston. 4 hours 14 minutes. The color converter is off the line at the moment, being recycled. We're showing black and white at this time.

CC Apollo 14, Houston. Over.

SC Go ahead.

CC Okay, we'd like to essentially try the docking again with the normal procedures rather then go into more drastic alternate procedures. We'd like you to reconfigure the dap. R1 should be 11102 for docking. We'd like you to go to extend release and hold it for at least 5 seconds and then return to retract and proceed with one more try at a normal docking. Over.

SC Okay, we'll put a narrow deadband in and we'll go extend for 5 seconds at least and back to retract and bang it again.

CC Roger.

PAO As you heard, Cap Com Fullerton passed along to Stu Roosa and other crew members of 14 that we're going to make another docking attempt with the established procedures prior to reconsidering alternate plans. We're at 4 hours 16 minutes now into the flight. We show Apollo -

CC Houston, make your closing rate on this try, not fast - not slow, just a normal closing rate.

SC Okay. We'll try it. I thought that's what I had the first time, but we'll give it a GO.

CC Roger. The first time looked that way to us. We just want to try it again.

SC Okay.

CC Apollo 14, Houston. When you do that extend release, for the ... at least 5 seconds so you can read the (garble) back to us.

SC Okay.

SC And Houston, we'd like to bring logics on and get another GO for Pyro arm.

CC Stand by. We're ready for logic on.

SC Logic is on.

CC 14, Houston. Your GO for pyro ON.

SC Roger. GO for pyro arm.

PAO Apollo Control, Houston.

END OF TAPE

PAO Apollo Control Houston, 4 hours 19 minutes now into the flight. Apollo 14 pressing on now with another attempt at docking. We show the spacecraft now at a distance of 15 thousand 821 nautical miles away from earth. We'll stand by and continue to minitor 4 hours 18 minutes now into the flight.

SC Houston, 14, are you ready for the extend release position of the switch.

CAPCOM That's affirmative, go ahead Al.

SC Okay (garble) and retract and extend release on my mark in 5 seconds. Mark. Barberpole stayed gray back to off. Barberpole still gray.

CAPCOM Rog, understand.

SC Back to retract barberpole still gray.

CAPCOM Roger, I understand the (garble) stayed gray all the way through.

SC Affirmative.

END OF TAPE

PAO This is Apollo Control, Houston, 4 hours, 27 minutes now into the flight. We show Apollo 14 at a distance of 16,889 nautical miles away from the moon - away from the earth. There has been no voice communication with the Apollo 14 crew for sometime as the 14 crew is pressing on for another attempt at docking and in Mission Control a probe and drogue assembly is on hand discussions are continuing here at the possible alternatives. We're at 4 hours, 28 minutes into the flight, continuing to monitor. This is Apollo Control, Houston.

END OF TAPE

SC Okay, Houston, we're starting to close in again.

PAO That's Ed Mitchell making the report at 4 hours, 31 minutes that they're starting to close in again at - on another attempt to dock with the Lunar Module. We presently show Apollo 14 at a distance of 17,453 nautical miles away from Earth.

SC Got 4 feet on it, Houston.

CAPCOM Roger, Ed.

SC Here it comes. No latch.

SC No latch, Houston.

CAPCOM Roger.

PAO This is Apollo Control, Houston, 4 hours, 33 minutes. You heard that report of no latch. In the control center we have a probe and drogue assembly. Looking very closely over it are backup commander Gene Cernan along with John Young and Chet Lee the mission director, and John Llewellyn who's on one of the flight control teams. We're at 4 hours, 34 minutes and we show Apollo 14 at a distance of 17,729 nautical miles.

END OF TAPE

SC Houston 14, I'm sure you're thinking about the possibility of going hard suit and bringing the probe inside to look at as we are.

CAPCOM That's affirmative, we may have one more configure to try prior to going to that. Stand by 1 now.

SC Okay.

PAO That was Al shepard who made the suggestion apparently being considered aboard the spacecraft, as it certainly is here at Mission Control, that of depressurizing the cabin, of bringing the probe inside for closer scrutiny. We're at 4 hours 36 minutes into the flight, we show 14 at a distance of 17 thousand 994 nautical miles away from earth.

CAPCOM 14, Houston.

SC Go ahead.

CAPCOM We'd like some more words on the exact appearance of the drogue, the scratches and so forth.

SC Okay, I'll try to give you the best, as I look at the probe and then you all can figure out where the docking latches are from there, but as I look at the probe and the docking positions, the prominent thing are we have three scratches about maybe a couple of inches long, and they're really, well the top one is about 12 o clock, maybe 11:30, and it is spaced equally around the ring, about 120 out. Now, there is one other scratch I didn't see before, I must have put it on this last attempt, I noticed it as we backed out, and it, there are a couple of other little ones, but the next prominent scratch is, oh, at about the 7 o'clock position. It starts at the hole and runs out for about 3 inches, maybe 4 inches.

CAPCOM Roger.

SC All these scratches are radial, and they're right up at the very apex of the drogue.

CAPCOM Roger.

END OF TAPE

CAPCOM Hey Stu. This is Gene. Do you read?

SC Yeah, loud and clear.

CAPCOM Okay. We got one more idea down here before doing any hardsuit work and let me throw an idea in and you come back with your impression.

SC All right.

CAPCOM We're thinking of attempting to dock actually without the aid of the probe which requires some pretty fine alignment. We're thinking that maybe you could go ahead and go through a normal plus X and put the probe in a drogue and while your holding AGS this will help you with your alignment and while you're holding a plus X go ahead and blow a bottle and try and retract the probe. Now if the probe retracts, it should retract well out of your way so that the actual docking latches with any luck on the alignment should mate. Now if you get one latch, we feel we'll be fat and we can get them off. There's one hooker. The configuration that we think you might be in electrically there may be a series path broken which doesn't allow us actually to retract the probe through blowing one of those bottles but we feel it sure is worth a chance - it's worth a try before we do any hard suit work.

SC All right. Gene, let me see if we understand you on that. Your thought is to blow one of the bottles to retract the probe after we're lined up and just before contact or wait until we contact and then thrusting and then retract the probe.

CAPCOM Okay Al we're thinking that actually if you use the - leave the probe extended until you actually contact that any small, minute alignment at least in translation left right up or down will be taken out as the probe centers in the hold of the drogue. If you can keep a plus X going at that time and then retract the probe hopefully your alignment will stay fairly close and we may pick up a couple of the docking latches. Now as I said, we got some reservations. We're not sure actually the probe is going to retract so you might keep that in mind but again, if it doesn't retract we haven't lost a model and if it does retract and you do get a docking latch we've accomplished what we wanted to.

SC Okay. Stand by 1.

PAO This is Apollo Control Houston at 4 hours, 43 minutes now into the flight - -

END OF TAPE

PAO ...3 minutes now into the flight. You heard the discussions between Gene Cernan, now at the CAPCOM position and Al Shepard. This bottle reference, this bottle of gaseous nitrogen, which activates a pneumatic system that retracts the probe. This is perhaps a consideration that will be pursued at this time. We're at 4 hours 43 minutes. We presently show Apollo 14 in an altitude of 18 thousand 928 nautical miles.

SC Okay, Houston, we'll review what we're going to do for you, and see if it is the right thing to do trying to make the approach. Close at a very slow rate till initial contact we're going to call out at that time, and applied plus x. I will then go to the retract prime 1 position.

CAPCOM That's it Al. That should do it if that probe does actually retract and if our alignment is good enough the possibilities are pretty good of picking up the dock on latch.

SC Your theory is it is going to retract because you feel the capture latches are locked.

CAPCOM Now actually the impression here is that it is not going to retract.

SC Okay.

PAO Apollo Control, Houston 4 hours 47 minutes now into the flight. Pete Frank, over the Flight Director's loop advised his ecom and his flight planning officer to consider procedures for the hard suit, if we are unsuccessful in this upcoming attempt.

SC Okay, Houston, we're on our way in now and we're going to try the plus x, after ignition contact, try the plus x until it's settled down for a second or two and then go to the retract cycle at that time.

CAPCOM Roger.

END OF TAPE

PAO Apollo Control, Houston, 4 hours, 50 minutes now into the flight. The booster systems engineer has just advised Pete Frank our flight director that his perdicted lifetime on the booster is 13 hours, 18 minutes. The first part of the hardware to degrade would be the batteries and that's a predicted lifetime now, of 13 hours 18 minutes on the third stage. We're at 4 hours, 51 minutes into the flight. We show Apollo 14 presently at an altitude of 19,930 nautical miles. This is Apollo Control, Houston.

END OF TAPE

SC We got some Houston.

CC Roger.

SC We had a hard dock, Houston.

SC We noticed no response for perhaps 2 or 3 seconds after iniating - prime retract 1, we then got barber pole on both, went grey on both at the hard dock.

CC Roger, Al. That's great. Super job, Stu.

SC Thank you.

CC It didn't even wiggle when you hit it.

PAO This is Apollo Control Houston. You heard that report. There was a cheer in Mission Control when that report came from Al Shepard. We're at 4 hours 58 minutes, standing by. We show 14 at 20 700 nautical miles away from earth.

CC 14, Houston.

SC Go ahead, Houston.

CC We'd like you to proceed now on with the normal hatch and tunnel procedures.

SC That's in work, Houston. We'll keep you advised.

SC Okay Houston. We're turning the TV off.

END OF TAPE

SC You do watch the cabin pressure pretty closely you know.

CAPCOM 14, Houston.

SC Go ahead.

CAPCOM Can you just give us a qualitative feeling of what it sounded like when those docking lights just did go. Did you get a sort of ripple bang or you convinced you've got quite a few of them?

SC Yeah. It was a ripple fire Gene. I'm convinced we did quite a few.

CAPCOM Yeah. That sounds pretty familar Al. It sounds like you're really probably - I wouldn't be a bit surprised to see if you got them off.

SC Yeah. I think we got quite a few, Geno. It was a good hard dock.

CAPCOM Beautiful. Tell Stu that session he had this morning paid off.

SC I believe it.

SC Yeah. And we're going to buy him his present from here.

END OF TAPE

CAPCOM 14, Houston.
SC Go ahead, Houston.
CAPCOM Okay, we'd like you to proceed on now with the normal hatch and tunnel procedures.
SC That didn't work, Houston. We'll keep you advised.
SC And Houston, I'm turning the TV on now.
CAPCOM Roger, Ed.
CAPCOM 14, Houston.
SC Go ahead, Houston.
CAPCOM We want to just verify that you're still all hard suited before proceeding with the tunnel procedures, not hard suited, but completely suited up before the tunnel procedures.
SC Roger. We will - roger, Houston. Why don't you review the procedures again on the checklist here and we'll check with you again when we get to that point. We do watch the cabin pressure pretty closely, you know.
CAPCOM Roger.

END OF TAPE

SC Houston, Apollo 14. We have lost 1/10 of 1 pound per square inch by the number 2 gauge during a 3 minute period. We'd like to proceed as we are.

CC Roger, Al. Stand by.

CC You're clear to GO on that.

SC Roger. Proceed.

CC Apollo 14, Houston. We'd like you to verify the H2 fans OFF.

SC That's verified.

CC Roger.

SC They delayed, they're off now.

CC Roger, Ed.

PAO This is Apollo Control Houston. We're at 5 hours 13 minutes now into the flight of Apollo 14. The present distance reading for Apollo 14 is 22 503 nautical miles away from earth, and following that successful hard docking, Apollo 14 is proceeding on with our basic mission plan. The crew of course will have a chance to look at the docking mechanism during the translunar coast period while Antares and Kitty Hawk are docked. We're at 5 hours 14 minutes into the flight and this is Apollo Control, Houston.

END OF TAPE

CC Apollo 14, Houston.

SC Go ahead.

CC Have some RCS quantity numbers - just - it should make you feel good. You used 131 pounds so far which is 62 pounds below nominal, but you're still 211 pounds above the red line. Over.

PAO This is Apollo Control, Houston. You heard those --

SC We got - We used 131 pounds which is 62 pounds below nominal. And say again how much above the red line?

CC You're still 211, 211 pounds above the red line.

SC And Houston. We got all the docking latches.

CC Roger. You got them all. Very good.

SC Al's checking more carefully now, but that's his first report.

CC Roger.

PAO Those were reaction control system usage rates passed along to the crew by CapCom Gordon Fullerton. Responding from the spacecraft was Ed Mitchell. We're at 5 hours 19 minutes now into the flight. We presently show 14 at a distance of 23 125 nautical miles away from the earth. Traveling now at a speed of 12 486 feet per second.

SC Okay, Houston. We got all the latches and everything was fine. All we had to do was just tap on number 2 and 8 to lock the handle down.

CC Roger, Stu. If you haven't bled the nitrogen with the red button, don't for a minute here.

SC Oh, you caught us in time. We have not bled.

CC Okay. Standby. We'll make sure that - what ECOM wants to do here.

CC 14, Houston.

SC Go ahead.

CC Okay, after a massive discussion here, we've decided to have you go ahead with the procedures as you see them in your checklist there. Verify the extend latch and gauged indicator not visible and then go ahead and bleed the GN2.

SC Okay.

CC Apollo 14, Houston.

SC Go ahead, Houston.

CC Roger. In 5 to 10 minutes the S4B fuel pressure should get up to the point where it'll vent. It's through a nonpropulsive vent - it shouldn't affect you much. Over.

SC Okay, in 5 to 10 minutes. Thank you. And we're just about to put the hatch back in.

CC Roger.

SC Houston, 14.

CC Go ahead, 14.

SC Okay, Gordon. Is there - want to make sure that we're all talking on the same frequency on this ejection and the maneuvering and everything. Have we got any changes on any of those procedures?

CC Stand by.

SC I guess what I'm wondering is after this long a time is the S4B still in the same condition and so forth and so on.

CC Okay, Stu. Stand by. I'll get a good summary of that.

SC Okay.

SC Gordon, be advised. We're on page L37 and ready for pre LM SEP and ejection.

CC Roger, Ed.

CC 14, Houston.

SC Go ahead.

CC Essentially, I'd like to go through procedures as you would have nominally. The only anomaly with the booster is that we have lost the downlinks on the launch vehicle digital computer itself. Your visual indications of its attitude and maneuvers are the only ones you will have. We have no readout on booster attitude down here. And actually, we lost many of the downlink parameters on the booster, however, it shouldn't affect the evasive maneuver and targeting to impact. Over.

SC Okay, Gordon. That's what I wanted to clarify before we pressed ahead so we'll press right on down and - as nominal and give you the call when we see it and so forth.

CC Roger.

PAO This is Apollo Control at 5 hours and 44 minutes. At the present time in Mission Control we are preparing for a shift handover. Flight Director Milton Windler is coming on to relieve Flight Director Pete Frank. That handover will occur after LM extraction. A short while ago, the Flight Director was asked when LM extraction would occur. His response was, whenever the crew is ready. The crew is proceeding to extract the LM in the normal manner at this time, and following LM extraction, there will be a change of shift briefing in the large Auditorium in building 1 at the Manned Spacecraft News Center. A short while ago, also, Gene Cernan, who was on the CapCom console made the remark following the successful docking that in paraphrasing was something as follows, a similar remark that I guess that practice we had this morning in the crew quarters paid off.

PAO He was referring to a mass which was said for him and Stu Roosa in the crew quarters at Cape Kennedy this morning. Recapping the docking situation, the docking was tried a total of 6 times before the successful hard docking occurred at 4 hours 56 minutes 46 seconds. On the sixth attempt, the procedure was for the 14 crew to maneuver up to the lunar module using the probe to aline the vehicles properly, to bring the docking mechanism in proximity with the docking ring on the lunar module and at that time to attempt to retract the probe mechanism hoping that the docking latches would then come together, would be properly alined, and that the hard docking could occur. This is, in fact, what appeared to happen although it is not certain at this time whether or not the docking probe did in fact engage and latch as it normally would or whether the docking mechanism came together with the docking latches engaging merely by virtue by the fact that the probe mechanism was retraced. In a normal docking, the probe which is a

SC ... please.

CC You have a go for PYRO on.

SC Okay.

PAO The go for pyro on indicates that the crew is preparing for LM separation. We'll continue to attempt to recap. Returning to live conversation in the event the crew or the CapCom speaks up. The normal docking procedure would be for the probe mechanism to engage the drogue in the lunar module. There are 3 small latches in the tip of the probe which extend after passing through a hole in the end of the conical drogue mechanism. This is soft docking. At this time the pneumatic system actuated by nitrogen pressurization draws the two vehicles together pulling the ... retracting the drogue or rather retracting the probe. Pulling the docking mechanism together and hard docking. We have a report now that the crew is trusting minus X which would indicate that they are extracting the lunar module from the S-IVB at this time.

END OF TAPE

SC Houston, the cryo press light is 02 tank 3.

CAPCOM Roger, we estimate that's probably stratification.

SC Rog. (garbled) tank 1 and 2 just dropped down.

CAPCOM Roger, we saw that.

PAO Our telemetry data indicates that the LM is clear, that the crew is maneuvering now to the attitude for the evasive maneuver.

CAPCOM Apollo 14, Houston. We'll be standing by from you for a, let you have the S4B visually and a go for the yaw maneuver.

SC Okay Gordon, it's just now is coming out from behind the LM for me in the left window here, about another 15, 20 seconds we ought to have a good view of it.

CAPCOM Roger.

SC And, okay, we're well clear Gordon, if you want to go ahead and do yaw maneuver at your convenience.

CAPCOM Roger Stu.

PAO This is Apollo Control at 5 hours 55 minutes. The crew now maneuvering into the proper position for the APS evasive maneuver, in some of the conversation, you've heard reference to the fact that data from the S4B is limited, and this lack of data has complicated -

CAPCOM Sent a checkout command to the booster which looked good, so we're getting ready to start the yaw maneuver now.

SC Why don't you give me a mark when it's coming.

CAPCOM Okay, will do. 14, Houston, we'll be commanding at 55 plus 3 0 about 5 seconds from now. Ready mark.

SC Okay, she's moving, Gordon.

CAPCOM Roger, Stu.

PAO The S4B moving into the proper position for the aps evasive maneuver. Our communications officer reported a drop out in data. They're checking to determine the cause of it. The concern mentioned previously about the controlling the S4B for the aps evasive maneuver refer to the fact that a multiplexer apparently has failed in the S4B instrument unit. The primary concern here is that in performing the maneuver, there are certain systems that flight controllers don't have as good a visibility into as they would prefer. However the fact that the S4B responded to the yaw maneuver command properly indicates that the systems are responding as they should and the aps evasive maneuver using the auxiliary propulsion system on the S4B will be performed

PAO as scheduled. This will be a 10 foot per second maneuver getting the separation distance between the S4B and the Lunar Module, and will be supplemented by a propulsive locks dock maneuver. The locks dock maneuver is designed to reduce the propability of spacecraft recontact.

SC Away from looking at us and it's a beautiful sight.

CAPCOM Roger Stu, it sounds good to us. We had some question about command capability and it sounds like it's okay.

SC Oh yea, she's going away from us.

PAO Following the auxilliary propulsion system maneuver, and the propulsive venting of the liquid oxygen aboard the S4B, there will be a targeted burn determined, or targeted to impact the S4B on the Lunar surface at approximately 53 degrees west and 20 degrees south, which is near the Apollo 12 landing site, and it is expected that this maneuver will be carried out as planned. You heard Stu Roosa on that last exchange report that the S4B was responding properly to command and appeared to be coming around in the proper attitude.

CAPCOM Apollo 14, Houston. Would you give us omni delta?

SC Okay, you have it Houston.

CAPCOM Thank you. Apollo 14, Houston.

SC Go ahead.

CAPCOM With a go from you up there we'll plan to initiate the Aps evasive burn at 6 plus 04 even, over.

SC Okay, yea, it's well foresighted away from us and we'll be standing by.

CAPCOM Roger.

PAO This is Apollo Control at 6 hours 2 minutes, 18 seconds, a little less than 2 minutes away now from the scheduled auxilary propulsion system evasive maneuver on the S4B. Capcom Gordon Fullerton advised the Apollo 14 crew that that maneuver would occur at 6 hours 4 minutes, with the liquid oxygen dump scheduled to occur at 6 hours 25 minutes, 20 seconds.

CAPCOM Apollo 14 Houston, the evasive maneuver shift is on now, how does it look?

SC Rog, we see the booster moving.

CAPCOM Now the last thing you can do for us on this, because of lack of determining the booster attitude is, as it fades out of view, if you can determine if it is still looking stable, over.

SC Okay, we can sure handle that, and, you got some venting there too, as you started that maneuver.

CAPCOM Roger, that's normal, I was expecting it.

SC Okay.

CAPCOM Apollo 14 Houston, would you go to

CAPCOM manual and wide on the high gain, but stay in omni delta?

SC You've got it.

CAPCOM Thank you ed.

PAO This is Apollo Control at 6 hours 9 minutes. We've completed our shift handover now at mission control. Flight director, Milton Windler, and his team of maroon flight directors, flight controllers. The flight dynamics officer has just advised the flight director that he does not anticipate a mid-course correction being required at the opportunity for mid-course correction 1. This would mean that the mid-course would not be made until the mid-course correction 2 opportunity. At the present time Apollo 14 is traveling at a speed of 11 237 feet per second. The spacecraft altitude is 28 593 nautical miles. There will be a change of shift briefing in about 30 minutes. The briefing will be held in the large auditorium in the MSC news center in Building 1.

SC Okay, Gordon, I'm sure ya'll have been talking about it, do you want me to press ahead with the maneuver to the P 52 attitude and go into that?

CAPCOM Roger, Stu, that's affirmative. We'd like you to go through with the normal procedures as shown in the flight plan down to that P 52 at 5 hours and 40 minutes, but at that point we're going to deviate slightly in order to save some RCS. We do not want you to do the fuel cell purge or the waste water dump. We're planning to have you oral and we do not want you to do the - go into DC. At that point we're planning to do the P23 which will be a little early and we'll have a new attitude for that. And then we'll go into PDC., Rright now it looks like mid-course 1 is not likely to be necessary, so that we'll save 1 PTC skin up, that way we'll save some RCS, over.

SC Okay, now at 5 50 you say, do not do the fuel cell purge or the waste water dump?

CAPCOM That's affirmative, Sut.

SC Okay, we won't do them.

END OF TAPE

CAPCOM 14, Houston.
SC Go ahead.
CAPCOM Roger. As soon as you get to your attitude there, we're ready to uplink the new REFSMAT to you.
SC Okay.
SC Houston, 14. Did you ever destroy the battery B charge?
CAPCOM Stand by, Ed.
CAPCOM Ed, that's affirmative. Go ahead with the battery B charge.
SC Okay.
SC Houston, 14.
CAPCOM Go ahead.
SC Hey, Gordon, I can - got a beautiful view of S-IVB now out of the left-hand window. She's stable as a rock.
CAPCOM Roger, Stu.
SC Ed, Houston. I'm initiating battery B charge.
CAPCOM Roger, Ed. Would you give us OMNI charlie, Ed?
SC You have it.
CAPCOM Roger. And at about 6:25:20 the launch stop should start on the S-IVB. You might keep an eye on it at that time. I'll give you a warning about 10 seconds prior.
SC Okay.
PAO Capcom, Gordon Fullerton, was advising the crew that the dump of liquid oxygen remaining in the S-IVB will occur at 6 hours 25 minutes 20 seconds ground elapsed time. This is the propulsive venting of the liquid oxygen which is aimed to increase the separation distance between the lunar module and the booster third stage and also is targeted to impact the S-IVB on the lunar surface near the Apollo 12 seismometer. We're now at 6 hours 25 minutes, 20 seconds away from the liquid oxygen dump.
CAPCOM 14, Houston. That launch dump should start in about 10 seconds.
PAO Booster reports the dump is initiated.
CAPCOM Apollo 14, Houston. The launch dump should be complete now. Did you see anything of it?
SC Yes. It's a beautiful sight Houston. The sun was shining from the side it was streaming out. We tried to get a couple of Hasselblad shots of it from the corner of the window. It's really fantastic.
CAPCOM Roger, Al.
PAO That was Apollo 14 commander, Al Shepard reporting a very spectacular sight with good sunlight on the liquid oxygen particles streaming out of the

PAO nozzle of the S-IVB. The launch dump is scheduled to be followed by an additional - -

SC Okay, Houston. You have P00 and ACCEPT.

CAPCOM Roger. And we'd like you to try to bring up the high gain now. Use a pitch plus 28 and a yaw plus 317. Over.

SC Roger. 28, 317.

PAO Once the high gain antenna is brought into play, we should see a marked increase in signal strength. The launch dump from the S-IVB will be followed by an additional maneuver to target the S-IVB to the proper impact point. That maneuver, performed with the auxiliary propulsion system.

CAPCOM Ed, this is Houston. We're having a little problem with our readout of high gain antenna angles here. Would you read out your onboard pitch and yaw angle?

SC Roger. Pitch of plus 29 and yaw of 320 - 330.

CAPCOM Say again the yaw.

SC About 330.

CAPCOM 330. Roger.

CAPCOM 14, Houston. We have the REFSMAT and trunion bias zero in there. It's your computer.

SC Okay.

PAO This is Apollo control at 6 hours 33 minutes. We'll be coming up soon on a change of shift press briefing. At that time we will take down the live air to ground circuits and record any conversation with the spacecraft for playback following the change of shift briefing. One bit of information from the flight surgeon. The flight surgeon reports that Commander Shepherd's biomedical data, primarily heart rate, resumed spontaneously at 1 hour 30 minutes ground elapsed time. At that time, the capcom asked if he did anything to fix the sensor and Shepherd replied nope. The readings on all three crewmen during the docking attempts are approximately as follows. During most of the unsuccessful attempts Stu Roosa, who was piloting the command module at that time, had a heart rate of about 120 beats per minute. The other two crewmen, Shepherd and Mitchell, were averaging around 70 beats per minute. And during the final successful docking attempt, Roosa's heart rate went from 120 to 144. At the present time the Apollo 14 crew is performing a program 52. This is a platform alinement. The spacecraft travelling at a velocity of 10 739 feet per second and now at a distance of 31 236 nautical miles from Earth.

SC Houston, 14.

SC Houston, Apollo 14.

CAPCOM Apollo 14, Houston. Go ahead.

SC Roger. Did you get our NOUN 93's?

CAPCOM That's affirmative. We copied them.
SC Okay.
CAPCOM Ed, would you give us the torquing time?
SC Roger. 006, 4035.
CAPCOM 6, 4035.
PAO This is Apollo control at 6 hours 45 minutes. At the present time Apollo 14 is travelling at a speed of 10 555 feet per second and at a distance of 32 283 nautical miles from Earth. Change of shift briefing is ready to begin now in the MSC News Center. We'll record any conversation with the spacecraft during this period of time and play them back following the press briefing. Also there will be questions from Cape Kennedy following the briefing during the course of the question and answer period. At 6 hours 46 minutes, this is Apollo control.

END OF TAPE

PAO This is Apollo Control at 7 hours 25 minutes. During the change of shift briefing, we advised the crew that it is being considered to have them remove the probe and drogue assembly from the docking tunnel, pull it down into the command module and activate the television so that we on the ground and the crew can get a good look at that particular piece of equipment. A decision to do so will not be made in all probability for another 30 to 40 minutes. At that time it will then require something like an additional two hours to get the necessary lines up between the receiving end - the receiving station at Goldstone and Houston, so the television transmission can be routed here to the control center. We'll play back the tape conversations which we have accumulated during the change of shift briefing and then continue to follow any other conversations live.

CC Apollo 14, Houston.

SC Go ahead.

CC Okay, if you haven't already, we'd like you to continue on through the rest of the procedures in the flight plan after the P52 down to 6 hours except don't do the O2 fuel cell purge or the waste water dump.

SC Okay, that's what we're planning to do.

CC And, then, Ed, I've got to have a longer update. Want you to do a P23, one that's scheduled for about 9:50 in the flight plan, correction 9:30 and if you can tend to that, I'll give you some new stars and other information to go then.

SC Standby. All right Houston, I have the flight plan open to 09:30.

CC Roger. Standby 1. Okay, Ed, on the P23, the optics cal attitude is the same as what's in there. Like you to change the P23 sighting attitude to ROLL 184, PITCH 2 -

SC Hold it.

CC Okay.

SC Okay, I'm ready, go again.

CC Okay, It's listed at 42. ROLL 184, PITCH 283, and YAW 310.

SC Okay the sighting attitude is 184, 283, 310.

CC That's right. And we have a change in the order of doing the stars. There's a couple of substitutions. I'd like you to use the listed star number 3, that's Gamma Centuari number 53, off to the - do that star first.

SC Hold it a minute. Okay 53 Gamma Centauri is first.

CC Yes, and then the star that's listed number 2, number 236 will be the second star.

SC Roger. (garble)

CC Okay, and then the third star is a different one, a new one. It will be star 161, Ioda Centauri, and earth's far horizon.

CC Okay, star 3 is 161, Ioda Centauri, EFH.

CC Roger. The NOUN 70 for that star is the same as the NOUN 70 on star number 1, it's probably easier just to write it down, that'll be 00 all balls on the first register, all balls on the second register, and 00120 on the third register.

SC Understand.

CC And noun 88 is completely different. First register minus 75603, second register minus 27129, and third register minus 59566. Over.

SC Okay, for Ioda Centauri, NOUN 70 is all zeroes, all zeroes, 00120. NOUN 88 minus 75603, minus 27129, minus 59566.

CC Roger. Ed, I read that correct. Okay the fourth star will be star number 24, Gienah, earth's far horizon. And NOUN 70 will be first register 00024, second register all balls, third register 00120 and you don't need a NOUN 88 for that one. Over.

SC Okay. The fourth star is 24, Gienah, EFH, NOUN 70 is 00024, all zeroes, and 00120.

CC Roger that read back's good. After you finish that P23, we'd like you to do the 02 fuel cell purge and the waste water dump. And then the activities that follow are still under discussion here, we're talking over possibly removing the drogue and taking a look at it at that time and possibly cranking up the TV to get us a picture of it back here, so the decision to start PTC after finishing P23 will depend on whether we're going to request you to give us some TV shot of the drogue, that's all. Over.

SC Okay, understand and following the P23 you want us to press on with the 02 fuel cell purge and waste water dump it's listed at about 11:25, is that correct?

CC Yes it's listed there and it's also the same thing you skipped back there at about 5 hours and 55 minutes.

SC Do you want us to do it immediately after the P23 or wait until 11:25.

CC If you'll standby, I'll check on that to be sure. Do that immediately after the P23, Ed.

SC All right.

CC One other thing while you have a pencil in hand, is a lift-off plus 15 P37 block data when you're ready.

SC Houston, go ahead with the P37.

CC Okay, Ed. Get emission is 01500, DELTA VT 5700, minus 165, PT for 400K 04504. Go ahead.

SC Okay GET is 01500, 5700, minus 165, 04504.

CC Roger, Ed, your read back's good.

CC Go ahead, Ed. Fourteen, Houston, go ahead. Fourteen, Houston, go ahead.

SC Roger. We didn't quite understand when you wanted us to start this P23 that you passed the info on.

CC All right now whenever you're ready.

SC Okay, Stu's going to get out of his suit here and we'll be ready in a few minutes.

CC Roger.

SC All right, Houston, 14, how do you read?

CC Apollo 14, Houston, go ahead.

SC Okay, Gordon, I just wanted to check and make sure that I was back on the com here.

CC Read you loud and clear.

CC Apollo 14, this is Houston. Over.

SC Go ahead, Houston.

CC Roger, Stu. When you get ready to commence your P23 -

END OF TAPE

SC Go ahead, Houston.

CAPCOM Roger, Stu. When you get ready to commence your P23, we have a change to the sighting attitude, based on your current estimated time of starting. Over.

SC Okay. And hey, could you give me an estimate on this. Do you want us to press on into that right now or you want us to go ahead and get the suits stowed and so forth.

CAPCOM That's really your option, Stu. Whenever you conveniently get ready to run a P23, why don't you check with us and we'll make sure you got a current attitude. Over.

SC Okay.

PAO This is Apollo Control at 7 hours 38 minutes. That completes the playback of the taped conversations between the spacecraft and Mission Control. We'll now continue to follow for any live conversation with the crew. The capsule communicator at this time is astronaut Bruce McCandless. McCandless relieved capcom Gordon Fullerton. At the present time, Apollo 14 is travelling a velocity of 9776 feet per second and the spacecraft is 37 248 nautical miles from Earth.

SC Okay, Bruce. How do you read?

CAPCOM Go ahead.

CAPCOM Apollo 14, this is Houston. Go ahead.

SC Okay, Houston. I'm getting ready to start this P23 and I guess that last P52 will still be good for this and I'll start in through the optics cal attitude and then get your VERB 49 attitude to start after that.

CAPCOM Okay. And I'll check and see if we want to update our attitude from the one I got here in front of me and we'll pass it up to you when you're ready.

SC Okay. And Bruce, I guess I want verify we do not need another P52. Been - what - an hour since that last one?

CAPCOM That's verified.

SC Okay.

CAPCOM Apollo 14, this is Houston. Over.

SC Go ahead.

CAPCOM 14, this is Houston. We'll like you to acquire us with the high gain antenna. Pitch, minus 75 and yaw plus 99. Over.

SC Roger. Minus 75 and plus 99.

CAPCOM Apollo 14, this is Houston. Change yaw angle to plus 120.

SC Okay, Houston. Locked up AUTO track.

CAPCOM Apollo 14, this is Houston. Ed, we'd like you to read out the pitch and yaw position meters on the

CAPCOM high gain antenna for us, if you would please.

SC Roger. The pitch is reading minus 90 and yaw is 150.

CAPCOM Roger. Minus 90 and plus 150.

END OF TAPE

SC I think about 180, I mean about minus 80 and 150.

CC Roger. 14 minus 80 and plus 150.

SC Okay, Bruce, how about that attitude for the P23.

CC Roger, Stu. The attitude will be Roll 179, Pitch 280, Yaw 310. Over.

SC Roger. 179, 280, 310.

CC Roger, out.

PAO This is Apollo Control at 8 hours 12 minutes. At the present time, the crew aboard Apollo 14 is preparing to begin a series of star sightings. They will do this in computer program 23. Taking sightings and marks on 3 stars to update the onboard guidance systems knowledge of where it is and where it is going. At this time here in Houston at the Manned Spacecraft Center and also at North American and Downing, California. Teams of engineers are in the process of putting together a set of procedures and evaluating the tests involved in running through a set of checks on the probe and drogue assembly on board the spacecraft. Once this set of procedures is worked out, and the flight director and team of flight controllers here in mission control had a chance to evaluate them, a descision will be made as to whether or not to attempt at removing the probe and drogue assembly and also bringing up the television to transmit television pictures of the evaluation back to Earth. Once that decision is made, it is estimated that it will take about 2 hours to get the lines up between Goldstone and Houston so that we can receive the television picture. Now, we still have some 3 hours 50 minutes of acquisition time remaining at Goldstone before a handover is made to the Honeysuckle station. The estimate is that it will probably take on the order of 6 hours time to get circuits up between Honeysuckle and MSC to allow transmission of television from Honeysuckle to here. And, more than likely, any television received at Honeysuckle would be recorded for later playback and would not be transmitted live to Houston. However, the plan would be to transmit television live from Goldstone some 2 hours after a decision to remove probe and drogue was made. Best estimate on when that decision might be made is it will probably be no sooner than 30 to 40 minutes. We'll keep you advised on any changes in that. At 8 hours 15 minutes this is Apollo Control.

PAO This is Apollo Control at 8 hours 30 minutes. Apollo 14 traveling at 9163 feet per second. Spacecraft is 41 842 nautical miles from Earth. The Flight Dynamics Officer reported that there appears to be a very small amount of venting occurring on the S-IVB. The venting is not probably causing any significant affect to the

PAO trajectory to the vehicle, however, it does affect the tracking data on it, and makes it difficult for the Flight Dynamics Officer to get a good vector on the S-IVB and from that to compute a predicted impact point. However, it is possible to compute the impact point based on the known position at the time the last propulsive maneuver occurred the last dump from that to compute an impact point. Based on the Flight Dynamics Officers computed impact point the booster Officer will compute a needed Delta-V and at 9 hours ground elapsed time command and auxiliary propulsion system maneuver with the S-IVB targeted to impact at near the Apollo 12 seismometer. There's been no communication with the spacecraft for the past 30 minutes or so. The crew is scheduled to begin a sleep period at about 16 hours. At 8 hours 32 minutes this is Apollo Control standing by.

CC Apollo 14 this is Houston. For your information the Booster people are planing a apse burn on the S-IVB at 9 hours GET even. Over.

SC Okay. Thank you.

SC Houston, 14. Do you have any idea where we should look to see it?

CC Stand by on that one, Ed. If we can get some good angles and stuff for you we'll send them up.

CC Okay. We've been moving around here, we've lost track of it.

CC Roger.

PAO This is Apollo Control at 8 hours 59 minutes. We're standing by now for the beginning of the S-IVB auxiliary propulsion system maneuver which will target the Saturn 3rd stage to an impact point near the Apollo 12 seismometer. That will be a 4 minute and 12 second burn targeted to put the 3rd stage in about 1.56 degrees souyh latitude and 33.25 west. Up on the S-IVB apse burn and we don't have a good attitude for you to look at right now.

SC Okay. We'll have a look around and see what we can see.

CC Roger.

SC Give them the hack on it, Bruce.

CC Roger. It's going now. It's about a 4 minute burn.

SC Houston, we are unable to spot the S-IVB.

CC 14, this is Houston. You can try looking out the right hand side window and with your line of sight depressed a little bit from the straightout position. In fact that's where it's engine bell was.

SC The Sun's coming in that window.

CC Okay. That's probably going to make very difficult to spot.

SC Makes it a little hard on the eyes.

SC We've been sincerely busy with housekeeping up here we haven't had a chance to describe anything we've been seeing. We'll get around to that after while.

CC Say again what you're going to get around to.

SC I said we'll get around to doing descriptions for you after while.

CC Roger.

CC Booster Officer reports the burn is complete. The burn has been completed, Ed. Thank you, Bruce.

SC Rich, we've been wondering if you found your headset alright when you got back to the (garbled).

CC Yes, I've got it on. I didn't notice anything wrong with it. You may be a little sutle for me but go ahead.

SC You obviously found it is working.

END OF TAPE

CAPCOM Roosa, we've been wondering if you found your headset all right when you got back in the MOCUR.

SC Yes. I've got it on. I didn't notice anything wrong with it. You may be a little subtle for me. But go ahead.

SC He obviously found it. It is working.

CAPCOM Apollo 14, this is Houston. I have a flight plan update for you.

SC I just got them.

SC Okay, Houston, go ahead with your flight plan update.

CAPCOM Roger, 14. We have a P52 that was previously scheduled in the flight plan at 9 hours g.e.t. We'd like you to hold off on that P52 until after PTC is established and then run it while in the PTC mode. After your P23's are complete here, we'd like you to perform the oxygen purge and waste water dump. Also perform the delta V test and null bias checks as called out in the flight plan at 9 hours and 20 minutes g.e.t. previously. And then you can deactivate the primary evaporator at your convenience. And we'll be having instructions for you on what we want to do on - with respect to the probe and drogue and I guess if we'd like your commentary or your feelings on how you'd feel about pulling it out and reinstalling it this evening before you turn in. Over.

SC Okay. You want the P52 regularly scheduled for 9 to be done after PTC is commenced. You want O2 purge and water dump and we've got (garbled) now and we'll do the delta V check and null bias check momentarily as soon as 23's been completed. We'll check the probe and call you back.

CAPCOM Roger. And - -

SC And, Houston, 14.

CAPCOM Go ahead, 14.

SC Okay, Bruce. I just wanted to say a word about that P52 that we had just before the P23 dump. Went to that P52 attitude and pick a pair - I went to pick the star that was (garbled) part of the LM. So you probably saw me dial in another star and the stars weren't probably separated too far apart as far as the criteria goes. So if anybody's looking at that, that's the reason.

CAPCOM Roger. We copy.

PAO This is Apollo Control at 9 hours 27 minutes. Apollo 14 now 46 539 nautical miles from Earth. Travelling at a speed of 8544 feet per second. We're still awaiting the arrival of a list of questions and procedures from the engineering support room. These questions will be passed up to the crew, asked of the Apollo 14 crew, and used in part as a basis for decision as to whether or not to ask

PAO the crew to remove the probe and drogue assembly from the docking tunnel of the command module.

CAPCOM Go ahead, 14.

SC Concerning the probe, I don't think we'd mind taking it out tonight. Discussing it with you, letting you look at it, and then leaving it out for tonight.

CAPCOM Okay, 14. We copy. And as I mentioned earlier, we haven't really gotten all the inputs yet on what we want to do. Whether we'd like to do this tonight or whether we might want to wait till tomorrow but I'll get back to you as soon as we have and we'll incorporate your feelings into the decision down here and send them back to you. And did you copy on my flight plan update? We'd like to get the primary evaporator deactivated whenever it's convenient with you all.

SC Okay. It's been deactivated.

CAPCOM Okay. Thank you.

PAO That last remark came from Al Shepard. Shepard stated that tthe crew would not mind removing the probe and drogue assembly tonight, but they would prefer not to have to reinstall it tonight before beginning their sleep period. And as you heard, capcom, Bruce McCandless advised the crew that the decision has not as yet been made as to whether or not the crew will be asked to remove the drogue and probe assembly. Discussions are going on at this moment around the flight director's console and we're still awaiting the engineering data which will also serve in part in making that decision. At 9 hours 30 minutes, this is Apollo Control continuing to stand by.

SC Houston, on the MSL bias check we had start at minus 100 and terminate with minus 99.4.

CAPCOM Okay, Al. We copy you started with minus 100 on an all bias check and you terminated with minus 99.4.

SC That's correct. Those two purges have been completed and waste water dump is in progress.

CAPCOM Roger, Al.

CAPCOM 14, this is Houston. Would you prefer to take time out to have something to eat or press on with the drogue operation now?

SC I think we could do both simultaneously.

CAPCOM Roger.

SC In our part of the drogue, Bruce, is to get it out, look at it, discuss it with you and give you some time to think about it and tie it down here with us while you think about it.

CAPCOM Roger. We're tentively looking at taking the probe out, doing that, tying it down and we may

CAPCOM want to take the drogue out but we thought you could just lock the drogue back in place and then the hatch to go to sleep for the evening.

SC Sounds good.

CAPCOM Okay. And be right back at you in about a minute with the hot smoking word.

SC Hey, Bruce, are we going to get in start PTC before we start in on the drogue?

CAPCOM That's unresolved right now, Stu.

SC Okay.

SC Houston, 14. This is a pretty fine snow storm we have going up here.

CAPCOM Roger. We copy.

PAO This is Apollo Control at 9 hours 39 minutes. The decision that's been made with respect to the drogue and probe is that the crew will be asked to remove the assembly. They will also be asked to unstow the television camera, get television coverage of it. However, the television lines will not be put up between Goldstone and Houston in order to avoid a 2 hours delay of the TV signal would be recorded at Goldstone for playback later. And the evaluation that would be done this evening would be a verbal evaluation from the crew with the TV to be recorded for playback at some later time. At 9 hours 40 minutes Apollo 14 is travelling at a speed of 8438 feet per second, now 47 557 nautical miles from Earth.

END OF TAPE

PAO At 9 hours 40 minutes, Apollo 14 is traveling at a speed of 8438 feet per second, now 47 557 nautical miles from Earth. This is Apollo Control at 9 hours 42 minutes. There has been a slight modification to that plan as far as the TV is concerned. The crew will begin as soon as convenient to remove the probe and drogue assembly, however the lines will be brought up from Goldstone. This will probably require an hour to an hour and a half and any television that is received at the time the lines are up will be released live. Any television kilowatt time will be recorded. So there is a possibility that we will get some live television toward the end of the probe and drogue activities aboard the command module. And the network controller is taking steps now to get those lines up between Houston and Goldstone. The estimate is that it will take, at this point, an hour and a half or perhaps a little longer.

CAPCOM Apollo 14, Houston, we're showing about 15 percent on waste water on telemetry now.

SC Rog, we've just shut it off, we're showing 22.

CAPCOM Roger, out.

PAO This isApollo Control at 9 hours 53 minutes. Here in Mission Control we're proceding with preparation for the removal and evaluation of the probe and drogue assembly aboard the spacecraft. A probe and drogue have been brought into the control center and will be used in directing the crew and in familiarizing flight controllers with the various aspects of the probe and drove assembly that will be discussed. Capsule communicator, Bruce McCandless has the assembly sitting near the base of his console and will use the assembly to direct the crew to preform the tasks that will be asked of them and discussing various aspects of the assembly. Again, to repeat the plan as far as television coverage of this activity is concerned the crew will remove the, actually they will vent the tunnel between the LM and the command module first and then remove the command module hatch, activating a handle on the probe assembly which will collapse the assembly and allow it to be removed from the tunnel. And finally removing the drogue, is required. This whole operation requires on the order of 15 to 20 minutes and will be followed by detailed examination with questions prepared in the engineering support room here at the Manned Spacecraft Center and passed up to the crew for their response. We have about 2 hours and 8 minutes of acquisition time remaining at Goldstone. It is estimated that it will require about an hour, perhaps and hour and a half to get the lines up between Goldstone and Houston so that we can receive live television. The crew will be instructed to unstill the television camera and television

PAO pictures will be recorded until such time the lines between Houston and Goldstone are up. At that time we will receive live television transmission. Following the completion of the evaluation of the Drogue and probe assembly we will play back the recorded television. At 9 hours 56 minutes, Apollo 14 is 48 956 nautical miles from Earth traveling at a speed of 8369 feet per second.

CAPCOM Apollo 14, this is Houston, over.

SC Go ahead.

CAPCOM Okay, Ed, this is what we would like to do on the probe removal or actually the whole probe inspection shooting match. We'd like to remove the internal hatch of course and make a quick visual inspection there to see if there is any thing that looks significantly amiss. If you see anything we'd like to photograph it and in this whole sequence we would like to have you power up the television and send a picture down which we'll receive at Goldstone and record. Although we still have about an hour or an hour and a half before we can figure to receive the television back here live. Then pressing on from there, if you want to make a couple of notes on a pad, we'd like you to perform the probe removal in accordance to the decal with the following exceptions.

SC Better hold up a minute, Bruce.

PAO This is Apollo Control at 10 hours 1 minute. Our network controller has just reported what perhaps is the fastest hour and a half work we've seen in some time. He reports that the lines are up and ready to receive live television from Goldstone, so hopefully, when the crew is ready to begin removing the probe and drogue assembly we'll have live television of that activity.

SC Houston, 14.

CAPCOM Go ahead, 14.

SC Can you give me the changes of this probe removal procedures so that I can copy it on page F 25?

CAPCOM Roger, actually we'll be looking at page S2-6 for the changes, that is the section that applies to both TLD and LOD, over.

SC Okay, I'm ready to copy.

CAPCOM Okay. At the top of page 2-6, the first step probe umbilical disconnection, go. We'd like you to verify proper connection of the umbilical before you disconnect and stow them. And I guess you might take a look for fat pins contact and all that stuff. Down about the 6th line where it says, capture large release handle lock, rotate counter-clock-wise to unlock, we'd like you to verify that it is locked prior to unlocking it. Got that one?

SC Okay, go ahead.

CAPCOM Down about 5 lines further we have

CAPCOM capture latch release handle pull, rotate to unlock 180 clockwise and we'd like you to pay particular attention to whether there is unusually high torque required to unlock the capture latch release handle in this step. And we'd also like you to verify the absence of or report any damage to the pyro cover or to the capture latch release handle. And the pyro cover that we are talking about is the, it looks like an extruded metallic shell just forward of the capture latch release handle there. It's the one that bears the decals on it that say, cock and unlock, over.

SC I'll tell you what, the damage to the pyro cover and what else?

CAPCOM Any damage

END OF TAPE

SC ... okay damage to the power cover and what else?

CC Any damage to the capture latch release handle?

CC And then as you pull it out, we'd like to know if you notice any unusual forces required to remove the probe.

SC Okay, let me read it back.

CC Okay, go ahead.

SC Probe umbilical before we disconnect and stow we want to verify that the (garble) are properly connected.

CC Yea, verily.

SC And there's 1, 2, 3, 4, 5 capture latch release handle lock before rotating counter clockwise unlock I want to clarify again that that is locked.

CC Roger.

SC And that you would like for us to pay attention to the torque required to loosen any of these items, oh, that's the capture latch release handle and you want us to observe for any damage to the power cover of the capture latch release handle and to observea ny obvious damage that is apparent at the capture latches or on the probe end.

CC Roger, Ed, and we currently have the lines from Goldstone back to the building up here so I think that we'll probably be ready to support the TV almost in real time. And for onboard photography, we're recommending use of the electric Hasselblad set on F2.8 1/125th of a second at 3-1/2 feet, magazine O for Okmulgee which is stowed in alpha 13 and you might verify the F stop with the spot meter set as ASA64 if you have the chance. Over.

SC Okay, I got that I believe. The electric Hasselblad, 2,8, 1/25th, 3.5, magazine O for open lockup, it's stored in A13 and we'll check it with the spot meter. How long will you have Goldstone coverage, Houston?

CC 14, this is Houston. We'll have Goldstone coverage for about another hour and a half. If that's any problem we can reconfigure to pick up Honeysuckle and the shutter speed is 1/125, that's 1 slash 125. Over.

SC Roger, understood. One twenty fifth. Edgy already down there.

PAO This is Apollo Control at 10 hours 13 minutes. We're still standing by for the crew to begin the operation of removing the probe assembly from the docking tunnel of the command module and we do expect that we'll have live television coverage of at least a portion of that activity. We have 1 hour 50 minutes of Goldstone acquisition time remaining and before we expect to lose acquisition from Goldstone and pick up primary coverage from the Honeysuckle site. At the present time Apollo 14 is 50 322 nautical miles from earth traveling at a velocity of 8 234 feet per second. With CAPCOM Bruce McCandless at the console, our Apollo 14 backup command module pilot

PAO Ron Evans and Apollo 13 command module pilot, Jack Schwigert.

SC Houston, 14.

CC Go ahead, 14.

SC Bruce, it'll probably be 15 minutes or so before we finish the job (garble)

CC Roger. We're standing by down here. We got the color converter going so we can watch you in glorious living color. Just give us a yell when you're ready to go.

SC Okay.

PAO That was Ed Mitchell reporting that it will be about 15 minutes before the crew is ready to begin the probe removal operation.

CC 14, this is Houston. When you get around to the hatch removal in the tunnel we'd like to get a LM/CM delta P reading prior to your equalizing the pressure. Over.

SC Roger, Bruce, we'll give you that.

CC Roger.

CC Stuart, how is your peanut butter?

SC Hey, big Jack, not enjoying any peanut butter.

CC You're doing a good job.

END OF TAPE

CAPCOM Apollo 14, this is Houston. Over.

SC 14. Go ahead.

CAPCOM Roger. If you're about wound up on eating, I've got a correction to the inflight erasable load of TFN for you and we'd like to suggest a change to the DAP to open you up to a 5 degree deadband to save a little fuel. Over.

SC Okay. We'll call you back in a minute.

CAPCOM Roger.

SC Okay, Houston. 14's ready to copy TFN.

CAPCOM Roger, Apollo 14. This is correction to the inflight erasable load procedure for TFN as found on page G9-4 of the G&C checklist. Under column B, line 04, now reads 33304 and should be changed to read 35242. Line 05, under column B, now reads 07000 and should be changed to read 03262. Over.

SC Okay. Page now - 9-5 that is. How about giving it to me again? Kind of slow that is. Go ahead.

CAPCOM Roger. That's page 9-4, under the OID line number 04 in column B, for buffalo, you'll find the entry 33304. That should be changed to read 35242. Over.

SC Okay. 04 Bravo, 35242.

CAPCOM Roger. And the next entry directly below it on OID line 05 now reads 07000 and that should be changed to read 03262. Over.

SC Okay. 05 column should read 03262.

CAPCOM Roger. Readback correct. And on your DAP we're recommending an R1 load - okay, I see you got it already. Sorry about that.

PAO This is Apollo Control at 10 hours 59 minutes. We're standing by for the Apollo 14 crew to begin removal and evaluation of the probe assembly. We do anticipate having live television coverage through Goldstone. And our network controller is making arrangements for satellite coverage from Honeysuckle so that we would have television through Honeysuckle also after we hand over to that site. At this time, Apollo 14 is 53 866 nautical miles from Earth. The spacecraft velocity is 7900 feet per second. And we'll continue to stand by.

CAPCOM Apollo 14, this is Houston. Go ahead.

SC Roger, Houston, 14. I got the camera set up and we're starting to work on the tunnel now. If you all are configured for television, we'll let you have it.

CAPCOM Roger. We're configured and let me see if we're ready to have you send it down.

CAPCOM Roger. Let her rip.

CAPCOM We're now getting a television picture.

CAPCOM Stu, this is Houston. Before you equalize would you give us the LM-CM DELTA-P.

SC Roger. We're working on that.

CAPCOM Roger.

SC Roger, Bruce. And it's .5.

CAPCOM Understand 0.5.

SC That's affirmative.

CAPCOM Roger that.

SC Okay, Houston, we're starting to bring our pressure up a little bit in the U tunnel.

CAPCOM Roger.

SC That's affirm.

PAO We haven't yet been able to make out who is up in the tunnel working in the hatch, removing the hatch.

SC Okay. Delta P zero.

PAO That's Ed Mitchell giving us the reports on the pressure differential.

PAO The spacecraft now 54 477 nautical miles from Earth.

PAO The greenish looking object floating on the end of the white tether is what is referred to as tool E. It's a hex-head screwdriver type tool.

SC Houston, we're starting to bring the hatch out now put it on the fender gage.

CAPCOM Roger, Al.

SC You're not getting much light on this Houston, but that's the hatch going under the left-hand couch.

CAPCOM Roger, Ed. Even with the low level light, we're getting a pretty good picture here, especially after it's color converted.

SC Can you see anything under the tunnel, Houston?

CAPCOM We really aren't seeing much in way of the docking mechanism. Here we go. That looks better.

SC Okay.

SC Okay, Houston, at the start of the inspection we find that the probe umbilicals are properly secured.

CAPCOM Houston. Roger, Al.

END OF TAPE

CC That was Al Shepard reporting that the probe umbilicals are properly connected. That was one of the things that we had asked him to verify before removing the probe assembly. Our best guess at this time is that Stu Roosa is the crewman working in the hatch area. Activation of the handle allows the probe mechanism to collapse inside the tunnel and makes it possible for the crewmen to remove the assembly.

SC Okay, Bruce, I don't know how well you can follow with the TV cameras down there but I didn't see anything obviously wrong with the umbilicals and the capture latch release handle lock was in the lock position.

CC Roger. Thank you, Stu.

CC And it appears that the 83 pound probe assembly is collapsing, sliding down out of the tunnel now.

SC Okay. The capture latch release handle turned very easily, Bruce.

CC Roger. Out. Stu, you didn't notice any damage to the pyro cover or anything like that did you?

SC No, I didn't Bruce. I looked it over here with a flashlight and, gee, I can't see anything out of the ordinary. We'll drag it down and take a look at the outside of it, but I didn't see anything wrong with the pyro cover or any of the connections or anything like that.

CC Roger.

CC And, Stu, while you're at it would you say that the force that it took to remove the probe up there from the tunnel area was high or low or indifferent.

SC Well, you know it's the first time I've done it without gravity helping a little bit, pushing back, but I wouldn't say it was exceptionaly hard. I had to brace myself on the bottom of the tunnel and gave a pull and she came loose.

CC Roger.

PAO I can see the head of Commander Alan Shepard just behind the probe.

CC Okay. We'd like you to examine the probe head as you're now doing with particular emphasis on any evidence of unusual sheer pin sheering in the bushing hole there at the end or foreign material in the capture latch release button area or foreign material or damage in anywhere in the areas of the capture latch hooks.

SC Okay. We'll give it a go.

SC Bruce, The first place we looked we don't see anything obvious about it. Instruct us where you'd like to look, we'll try to bring the camera right in on it for you.

SC And, Bruce, up here in the very tip of the probe, you know where the tower hooks on it it looks

SC clean. I don't see anything fishy about that right off the bat.

CC The bushing on the end you're describing to me, Stu.

SC Yes.

CC Okay. 14, we'd like to get some closeup photos of the probe head around the

END OF TAPE

CC Okay, 14, we'd like to get some closeup photos of the probe head, around the capture latch release button of each capture latch hook and if you find any scratching or damage up there in that area in particular, also.

SC Okay, Bruce.

SC Houston, looking at the Probe we see that there are three scratches that are rough to the touch.

CC Al, this is Houston. You're coming through very weakly. Can you maybe put the mikes closer to your mouth, I think that might be the problem.

SC Okay. I was looking up away from the light up in the tunnel I'm looking at the drogue and there are these radial scratches I described before (garble) that have - that feel rough to the touch. They probably scratched the surface of the drogue perhaps a quarter of an inch.

CC Roger.

CC Al, this is Houston. When you went through the dimensions associated with these scratches, you mentioned a quarter of an inch. Now, was that width or length? Is that the penetration or length or what? Over.

SC I was trying to describe the depth of penetration. It's very difficult cause we don't have any kind of gauge, but it has scratched the surface to the depth of perhaps, I don't know, 3 or 4 thousandths maybe. Very definitely scratched. It's rough to the touch.

CC Roger.

SC Now I'm confused, CAPCOM. Is that scratch 3 or 4 thousandths?

CC We understand you're saying they're about 3 or 4 thousandths of an inch deep and on the order of a couple of inches long.

SC That's right. They're very light. They all - as I said before radial scratches leading away from the apex of the drogue and some are about 2 inches long, one's about 1 inche long, one's about 3/4's and one's about 1/2 inch long. These are (garble) marked and may (garble) cut into the service of the drogue.

CC Roger, we copy.

CC Okay, when you get through taking some photos up there, we'd like you to take the capture latch release handle, pull rotate it counter clockwise to the cock position and then manually depress all 3 capture latch triggers at the base of the capture latch hooks simultaneously and varify that the capture latch release button should move forward to the lock position flush with the probe bushing.

SC Okay. Why don't we do that and then when we get all through, we'll go through and get the other pictures you want.

CC Roger.

SC And we're going to bring the drogue out too so you can take a look at it on the TV.

CC Roger, Stu, and after you do get it out we'd like you to hold the TV steady on the area of the drogue where the scratches are for a couple of minutes and do likewise again on the capture latch area on the probe.

SC Okay.

END OF TAPE

SC Houston, we're moving the television camera on the drogue. Put a light on it, it is pretty bad.

CAPCOM Roger.

PAO We're now looking up into the docking tunnel towards the lunar module.

CAPCOM 14, this is Houston. We're getting a picture, but the illumination level isn't very good. I guess - Ron can't see any scratches right here.

SC Roger, it is pretty hard to see it in Houston. The light level - we're going to try another little trick here, Richard, get you some light.

CAPCOM Okay.

SC Okay, Houston, we're going to move in on the - you're looking at the center of the drogue now and the scratches, you can see Stus' thumb, there. He's going to point to them and we'll see if we can get enough light so you can see them.

CAPCOM Okay. Roger, we got that last one, still and we got that one you're pointing at now.

SC Bruce, I think that this illumination will give it to you if you will let me hold it from this end.

CAPCOM Roger we can see about 5 or 6 of these radial scratches in the first seam, right where you're looking there, about 3 of them. One.

SC Yeah, that's affirmative, Bruce.

CAPCOM Okay, now, I guess that at the 4 o'clock position you got about 3 scratches and than at 8 o'clock you've got one. Do you have anything up at noon?

SC That's affirmative, Bruce. There's a little one at 12 o'clock noon.

CAPCOM Roger.

SC Press your luck, from the feel of it it appears that the probe hit the drogue off at dead center every time we tryed to make contact. It just rebounded right off of it.

CAPCOM Roger, we copy.

SC Okay, we're going to put the drogue back in place if you're through with them.

CAPCOM Negative, we'd like you to hold it out for a minute or so. We ultimately want to wind up fit checking of the drogue and probe here.

SC Okay, back on the probe, we'd like you to take the capture latch release handle, pull, rotate counter-clockwise to the cock position or a 150 degree rotation.

SC Okay, I've done that.

CAPCOM Okay, manually depress all three capture latch triggers at the base of the capture latch hook simultaniously and verify that the capture latch release

CAPCOM button at the end of the probe moves forward to the lock position, that is flush with the probe pushing.

SC Okay, you want us to push all three of them simultaniously, is that right?

CAPCOM That's right.

SC Say it again, and verify what?

CAPCOM Okay, the little button, right at the tip of the probe which is the capture latch release button from the LM active side, where you have you're finger, should pop out flush when you trigger all three of these latches simultaniously.

SC Okay, I pulled them back there and it came out and it appears to almost flush. You can count it as flush, the way it is now. We're going to repeat it Houston.

CAPCOM 14, Houston. We're requesting medium beam width on the high gain antenna and we're going to hand over from Goldstone here shortly.

SC We repeated that, it comes out flush.

CAPCOM Roger.

END OF TAPE

CAPCOM And looking at that button do you notice anything unusual about any burs any bending or any way it could be hanging up on something?

SC (Inaudible)

CAPCOM Say again, Ed. We had some static.

SC It all depends, Bob, on what you're going to do.

SC Al's taking a look at it. The top of the button looks smooth so you can't see down below it. But it seems to keep from knocking very easily. (garbled) better be (garbled) it off.

CAPCOM Okay. I guess that's what we really wanted to know about it.

CAPCOM 14, Houston. If you could, on the TV pictures, refrain from using the flashlight in close here. I think we've got enough light to see it with the ambient light.

SC Okay.

SC Maybe you do. We don't seem to.

CAPCOM Okay. We got 30 seconds to hand over so we're going to just go into a standby mode here for a minute or so until Honeysuckle picks up.

SC Okay.

CAPCOM And Ed, now that you've got the capture latches in the locked position out there on the end of the probe, we'd like you to push as hard as you conveniently can in zero g on each of the capture latches and verify that they do not depress.

SC We've done that. We'll do it again in the main dump.

CAPCOM Okay.

SC Houston, they're not going to go in that way.

CAPCOM Okay. They shouldn't.

CAPCOM Okay, 14. Now we'd like you, using tool B or some other suitable tool, to depress the capture latch release button in the end of the probe there to cock the capture latches.

SC Roger. Stand by.

PAO Our network controller reports that we are now getting a television signal from the station at Honeysuckle Creek, Australia.

SC Houston, we can cock the capture latches by pressing in the button on the end of it.

CAPCOM Roger. And now that you've got the drogue out, we'd like you to position the drogue and push it over the capture latches until the capture latch release button extends and I guess we'd like you to do it several times and try applying different combinations of offset, CAPCOM side load and torque on the thing and check it up for any indications of dragging, binding, or anything it might be giving the problem that you experienced a few hours ago.

SC Okay. Say again how you would like us to cock the capture launches the way we just did by depressing the button on the end of the probe. And then fitting it over the end of the drogue several times (garbled) - -

END OF TAPE

SC Okay. Say again now how you would like us to cock the latches the way we (garbled) just did by depressing the button on the end of the probe and then putting it into the probe several times (garbled) is that correct?

CC That is correct. If you put the probe in a fixed place and then put the drogue over it you can slide in through the hole on the end of the drogue and keep a good eye on things.

SC Roger.

CC 14, and one of these times when you have the drogue on over the end of the probe you might try just holding the drogue in position and wiggling the capture latch release button in and out several times. In this condition it won't do anything but it will allow you assess possibilities of finding or sticking of that particular mechanism.

SC Houston, I'm going to get rid of the TV camera for a minute. It's not doing us any good and it's taking all 3 of us can handle it.

CC Okay. Roger.

SC And, it appears we may have to get (garbled)

CC Okay.

END OF TAPE

CC Ed, this is Houston. Have you had any luck I guess you could call it, in getting the probe and drogue to mind by applying lateral forces to the drogue?

SC Not yet. Standby, we're getting ready to try again now.

CC Check.

SC Hey, Bruce, there just wasn't any place that worked handily with that. We're going to put the drogue back in, Al's on the other side and then we can put it up in there right.

CC Okay, Ed, by other side do you mean over in the LM?

SC That's affirmative.

END OF TAPE

SC Houston, 14.

CC Go ahead 14.

SC Okay, Bruce. We spackeled it about 4 or 5 times, and it goes in just so easily. The capture latches dock and hold it and we tried it by putting the capture latch release handle in 150 and putting it up and moving it in. We've tried it by leaving it on the yellow and cocking up by pushing in on the end of the probe on the probe release plunger. And, it works both ways just fine.

CC What you're trying to tell me is you still haven't come up with anything that would be the problem.

SC That's basically it.

CC Will you pass over to Al while you've got the probe and drogue in the tunnel there and made it easily on the other side and keeping them engaged. Would he push the capture latch release button in and out several times and see if he can make it stick up against the bushing by pushing sideways or (garbled) on it while it's being pushed in and out.

SC Okay. We'll try that.

END OF TAPE

CC 14, this is Houston. While you're up there in the tunnel, we'd like to get a roll angle readout from the index mark as you come back through and with respect to further procedures, I guess we got a rain coming down here which is (garble) says further instructions will follow tomorrow.

SC Didn't quite understand all that, Bruce, would try it again.

CC Okay, we're asking for a docking tunnel roll index reading at your convenience and -

SC Okay, we got that.

CC You've exhausted our imaginations for right now on trouble shooting the probe. We'll work on it some more over night and be back with you in the morning.

SC Roger, Houston, understand.

CC And would you confirm that Al was unsuccessful at getting the capture latch release button to bind up against that bushing in the end of the probe.

SC That's a negative, Bruce. We cycled it several times and he pushed on it and tried to jimmy it and we - the thing slides in just so easily and locks up and when he pushes on the plunger why she releases very easily and we can't seem to find any bind or get it to malfunction for us at all.

CC Okay. While holding the probe in place there we were wanting him to just take and cycle the capture release button in and out several times trying - doing his best to bind it up against anything he can find there in the way of the internal surface of the bushing. I guess you're telling me that he was unable to.

SC Okay, well we hadn't really run that specific test, we'll try that.

END OF TAPE

SC Houston, we're bringing Al back through, we can not force it to malfunction at all. You're going to have to think about it over night.

CAPCOM Roger, 14, we'll do that. We recommend that after you get Al back on the command module side you reinstall the drogue in the command module hatch and keep the probe over in the command module. We believe we've seen enough TV data for the time being so you can shutdown the television at your convenience. And we would like to get photographic documentation of the capture latch release button of each capture latch hook and any areas of scratches or visual damage on the probe.

SC And Houston, the docking rule index is plus .9.

CAPCOM Understand, plus 0.9 on docking roll.

SC That's affirmative.

CAPCOM Roger, that's good. Stew, this is Houston, you're clear to start getting set up for PTC at you're convenience. We'll be watching the rates and on this first PTC initiation, we'll probably want to go very close to the full 20 minutes of rate damping. We expected a subsequent one during the mission we'll have a better feel for it and just be able to que you as to when to initiate the roll based on the rate we're observing.

SC Okay, understand and we don't mind waiting 20 minutes.

CAPCOM Roger.

END OF TAPE

CC Apollo 14, this is Houston. When you do close the hatch and aline we'd like you to give us a mark so we may confirm the flood lights off, over.

SC Houston, standby.

CC Roger. We weren't intending to rush you, just when it happened, give us a yell.

SC Okay.

PAO This Apollo Control at 12 hours 20 minutes. We're in the process now of handing over shifts flight director Jerry Griffin and his team of flight controllers coming on now to replace flight director Milton Wendler. During the shift that is just ending, the Wendler team came on just after the Apollo 14 crew had successfully completed docking on the sixth attempt that occurred at ground elapsed time of 4 hours 56 minutes 46 seconds. And following that, the Saturn S-IVB was successfully configured for the auxiliary propulsion system evasive maneuver and the subsequent launch dump and midcourse correction to put the Saturn third stage on a trajectory which will impact the moon in the vicinity of the Apollo 12 seismometer. The up flight dynamics officer had a bit of difficulty in computing the exact impact coordinates due to a small undetermined small venting from some undetermined origin on the S-IVB. The venting apparently having no significant effect on the trajectory but affecting the data on which the trajectory is computed. And at this point our trajectory analysis is not too precise, we expect that with additional tracking that the impact coordinates will be more precisely established. At the present time, the tracking data shows that the S-IVB will impact at 8 degrees 34 minutes south 23 degrees 17 minutes west at a ground elapsed time of 82 hours 37 minutes. And following the midcourse correction on the S-IVB, the crew was advised that the - it would be desirable to remove the probe and drogue assembly with the television activated and to trouble shoot the assembly and see if any obvious problem could be found. After going through a series of 12 step-by-step items, the only conclusion that the crew was able to reach was that there was no obvious defect with the probe or drogue assembly. The drogue was reinstalled in the tunnel area. The probe has been left out and additional trouble shooting will be done tomorrow after the crew completes it's sleep period getting the engineering support people in mission control and Downey, California some additional time to determine what area to proceed in trouble shooting next. The booster systems engineer's just reporting status on the S-IVB the Saturn third stage, he reports that all tank pressures appear to be down to zero and that the booster is in a stable configuration. No further

PAO activities planned with the Saturn third stage. AT 12 hours 24 minutes into the mission Apollo 14 is 59 996 nautical miles from earth traveling at a speed of 7 395 feet per second.

CC Apollo 14, Houston.

SC Go ahead.

CC I've got a com configuration for you set up in here for PTC.

SC Okay, Houston, standby.

SC Okay (garble) go ahead.

CC Okay, you can set the high gain PITCH and YAW indicators to PITCH minus 52, and YAW 270 degrees and then select OMNI the BRAVO.

SC Roger. 52. 270 up to BRAVO.

CC Okay, and then track to manual and wide beam once.

SC You have it.

CC Okay, Ed.

SC Houston, Apollo 14.

CC Go ahead, 14.

SC Rog. We were busy with the probe at 11 hours and we're inquiring about turning off the waste storage vent valve and shifting our heater configuration to the O2 tank.

CC Okay, Ed, waste storage vent can go to close and the heater configuration 1 and 2 to OFF, 3 to AUTO.

SC So be it.

CC And Apollo 14, Houston.

SC Go ahead.

CC Did you all by any chance vent the batteries back at 11 hours?

SC (garble) I am getting ready to do that now.

CC Okay, Ed, Houston, suggest you do that before we get the PTC so we get all that closed up.

SC Houston, 14.

CC Go ahead, 14.

SC Okay, Fred, Al's closed the LM hatch and he verified the flood lights went out before the hatch closed.

CC Okay. They say saw it here, sorry.

SC (garble) they get it.

CC They saw it here too on the power I guess.

SC Okay. And I'd like to clarify one thing, it seemed like bruce implied that we would keep the probe in here with us and we'd just like to store it in the drogue for the night, it's so easy just to open the hatch and get it back out again if we want to dissect it tomorrow or something.

END OF TAPE

CC Yes, that sounds alright, Stu.
SC Okay.
CC 14, Houston.
SC Go ahead.
CC I'd like to verify that you had the waste stowage vent to lose now.
SC Okay. That's verified, Fred. We're still venting the battery.
CC Okay.
SC Houston, 14.
CC Go ahead 14.
SC Fred, the battery vent seems to have stopped at a reading of about 2 and a half volts. It dropped very quickly to that and it's just been staying there. Can you tell if the vent is complete?
CC Stand by on it.
SC Sorry about that, point 25.
CC Did you correct that and say .25?
SC That's right 2 and a half units, Fredo, .25 volts.
CC Okay.
CC Okay, 14. That reading will be okay.
CC 14, Houston. Did you copy, the .25 reading is good enough.
SC Thank you, Fredo. And, battery vent is terminated.
CC Okay.
CC 14, Houston.
SC Go ahead.
CC Okay. You give us accept there. We'll pump you up a state vector and I have P37 block data for you.
SC Okay. Stand by one.
SC There's the accept.
CC Okay.
SC (garbled) Go ahead with the P37.
CC Okay. Stand by one.
CC Okay, Ed. P37 block data 02500 4971 minus 165 06912 035 00 7548 minus 165 06835.
SC Hold it, Fredo.
CC Okay.
SC I thought you're reading me P37 block data.
CC That's what it says.
SC Okay. Let's start over again. GETI.
CC Okay. GETI 025 00 4971 minus 165 06912 That's a GET at (garbled)
SC Roger. 02500
CC Go ahead.
SC How many you going to read me up?

CC Four of them Ed.

SC Okay. Didn't understand.

CC Okay. The next one. 03500 7548 minus 165 068 35 and the third one is 04500 5725 minus 165 09258 and the last one 06000 5242 minus 165 11702.

SC Okay. 02500 4971 minus 165 06912 03500 7548 minus 165 068 35 04500 5725 minus 165 09258 0600 5242 minus 165 11702.

CC Okay. And, remarks the second through the fourth set there Ed. The 35 hour 45 hour and the 60 hour block data assumes a midcourse two.

SC Understand. 35 45 and 60 hours assumes micdourxe two.

CC That's affirm, Ed. And we're still watching your rates here. We'll give you the word when they're ready for the GET.

SC Thank you.

PAO This is Apollo Control 13 hours 20 minutes ground elapsed time in the flight of Apollo 14. Crew presently sending up the passive thermal control drift rate of the so called barbeque mode of

CC You need to go back to block on the computer.

SC Okay.

SC Okay. And, Fred, we got the hatch back in and when I put the probe up for stowage I looked again at that pyro cover that Bruce had asked me about before and I can't see anything wrong with the probe anywhere.

CC Okay.

PAO Another comment by Stu Roosa on the continuing mystery of why the docking probe malfunctioned in the earlier attempts right after translunar injection to dock with the lunar module. Attempts to duplicate this failure in flight as well as here on the ground has been frudelous so far. The training model of the probe and drogue are sitting on the floor in the aisle next to the spacecraft communicators console here in mission control. Meanwhile, the tests in flight have been postponed or suspended until after the rest and meal period for the crew of Apollo 14. The Spacecraft is now 63 937 nautical miles out from Earth, and a velocity of 7100 feet per second. We'll continue

END OF TAPE

PAO We'll continue to monitor air ground here in Mission Control as the crew prepares for the nights rest and getting the spacecraft set up on the slow rotation of passive thermal control, PTC. At 13 hours 22 minutes ground elapsed time, this is Apollo Control.

CAPCOM 14, Houston.

SC Go ahead.

CAPCOM It looks like you quit moving around in there, Ed. The rates are down. I guess yall can crank up PTC.

SC Okay.

SC Be right with you, Fred.

CAPCOM No hurry.

CAPCOM 14, Houston.

SC Go ahead.

CAPCOM Just a reminder. You might make sure you've brushed your teeth and all that kind of stuff before tucking her in there, before you crank up that PTC.

SC Roger.

SC Houston, 14.

CAPCOM Go ahead, 14.

SC Okay, Fred. I'm going to spin it up. I'm going to use PD roll if that's agreeable with you.

CAPCOM Okay. That will be fine.

SC Okay.

SC And Houston, 14.

CAPCOM Go ahead.

SC Hey, Fred, I guess we've already said everything we can to try to help yall out on that probe. We're sitting here trying to run back over. I want to make sure that we're not overlooking something that might give you a clue. And when we did our docking, as I was thrusting plus X and then Al hit the retrack, he said the talkback came back barber pole for a time period, you know, like a couple of seconds before - and then went gray again when we got the dock. Now I just tossing that in. I think we called that, but I just wanted to make sure we've covered everything.

CAPCOM Okay. We had already gotten that, Stu from your previous comments.

SC Okay. I just thought maybe there in the rush of things, you know, we might not have got it in. I can't think of anything else to add, I guess.

END OF TAPE

CAPCOM Okay, Stu, I guess we got nothing else on the probe, business just wanted you to verify that you got the LIOH canister changed and your PPC start up looks good.

SC Okay, we got the glyo changed about 13 07.

CAPCOM Okay.

PAO This is Apollo Control, 13 hours 50 minutes ground elasped time. And that last exchange of conversation between command module pilot, Stu Roosa, and spacecraft communicator, Fred Hayes, here in mission control. Stu thought that one item that perhaps he did not mention during the earlier discussions of the docking probe problem, turned out he had mentioned them. They had to do with the indications of some divices in the cabin called talkback. They're little striped devices that show through a little window and when they're still they have stripes, when they're spinning they turn grey because of the visual effect of black and white stripes moving at high speed. However, if he had already mentioned these indicators earlier in the evening, he reported also that at 13 hours 7 minutes ground elapsed time they had changed the Lithium Hydroxide canister in the command module. These canisters serve to scrub the Carbon Dioxide from the cabin atmosphere. Earlier this morning, the flight director, Jerry Griffin was down fiddling with the probe and drogue mechanism sitting on the floor here in mission control scratching his head over it. And at this time, or perhaps later in the day, at various locations around the country where the probe and drogue had been designed and manufactured, other people will be scratching their head trying to sort out why the drogue did not latch on the first several attemps at docking of Apollo 14. Flight plan calls for the crew to go to sleep at about 16 hours ground elapsed time which is about 2 hours 8 minutes from now. There is an outside chance that they may decide to move that up a bit. At the present time they're getting set up in passive thermo control, PTC. Statis reports coming out of the spacecraft analysis room, they're rather brief. All systems purking along quite nominally. Shows the - at 11 hours 7 minutes the leak rate in the lunar module and command module tunnel joint was about 5/10 or 5/100 of a pound per hour of oxygen or atmosphere. Guidance and control are all up to snuff, communications are normal, displays in control all nominal, down through all the rest of the spacecraft systems. There is a slight drop below what is nominal at this time in the flight for the command module, command service module reaction control systems porpellents. In the propellent remaining, in as much as quite a bit was used in the several dockings attempts but still within the acceptable budget. Electrical system, battery B is still charging in the command module. All other batteries are topped

CAPCOM off, about 107.47 amp hours remaining in batteries A, B, and C. Fuel cells, quidagentic storage tanks, all operating normal at this time. No problems according to the notations by the spacecraft analysis room who generates these reports about every 2 hours. Apollo 14 now weighing, according to the space digital display, 98 110 pounds. Altitude above the Earth out from the Earth, 66 183 nautical miles, velosity, 6943 feet per second. And at 13 hours 55 minutes ground elapsed time, this is Apollo Control with an open circuit, Apollo 14 air-to-ground communications.

CAPCOM 14, Houston.

SC Go ahead, Houston.

CAPCOM You can terminate battery charge now.

SC Okay.

END OF TAPE

CC 14, Houston.
SC Go ahead.
CC For some reason, we've shown your PTC has gone out of the - gone out of the box there so (garble) I need to reinitialize but would like to continue with the ROLL here until we get in good shape on the OMNI.
SC Roger (garble)
CC Got you.
SC (Garble)
CC 14, Houston.
SC Go ahead.
CC Okay, whenever you get a chance, after the 52 there, I guess you can stop the PTC and re-initialize, we're in good OMNI region now.
SC Okay.
CC And, 14, Houston. We're not real sure what caused the PTC to diverge. It looked like a pretty good start unless you either vented something or maybe something continued to vent from a while back.
SC That's a more likely we had a continuing vent.
CC Okay.
SC Houston, this is Apollo 14.
CC Go ahead, we got your NOUN 93.
SC Did you get our (garble) time of 141250?
CC Okay.

END OF TAPE

CAPCOM 14, Houston.
SC Go ahead.
CAPCOM 14, we're having a little trouble with data dropout. In your present position, we'd like OMNI charlie.
SC Try again, Fred. We are getting busted up on that one.
CAPCOM Okay, Stu. We're having data dropouts. We'd like OMNI charlie.
SC Okay, Fred. Try us again real slow. Your just coming in syllables.
CAPCOM Okay. We would like OMNI charlie. OMNI charlie.
SC Okay. Okay. There's OMNI charlie. How's that?
CAPCOM Okay. How do you read me now?
SC Okay. You're loud and clear.
CAPCOM Roger. We were having some data dropouts on high bit rate there, Stu, and we - when we get ready to tank up PTC we'll have you go back to Bravo then.
SC Okay.
CC 14, Houston.
SC Go ahead, Houston.
CAPCOM We're showing O2 flow tanks high down here. Just wondered if you're getting it onboard too.
SC Yes, we are, Fredo.
CAPCOM Okay.
SC We thought we'd stopped - stopped all venting but we apparently are still venting somewhere we're not aware of.
CAPCOM Okay.
CAPCOM 14, Houston.
SC Go ahead. Fredo.
CAPCOM Just a question. Did I understand you to say that you had checked and you got all of your vents closed up now?
SC That's affirmative, Fred. We're looking right now to see if we can find where this is going Stand by to mark.
CAPCOM 14, Houston. You change anything now. We're seeing the O2 flow dropping off a bit.
SC Roger. Did you see any marked change? We just (garbled).
CAPCOM Well, it was up over .9 there, Ed, and it's down around .7. Gone back up now to .8 something now.
CAPCOM 14, Houston.
SC Go ahead, Houston.
CAPCOM Okay. Our original thoughts were that it might be a ducer. If you haven't already done so

CAPCOM you might run through ECS mal 18. And see how you come out of that one.

SC Fredo, we can see the venting right now. We think we've got a natural problem.

CAPCOM Okay. What side of the spacecraft, 14?

SC It's coming off the port side.

CAPCOM Okay. The port side.

END OF TAPE

CC 14, Houston.

SC Go ahead Houston.

CC Okay. We saw it drop off. I guess you cycle (garbled) It's alright would indicate the ducer's okay. You might check again the valve on top of the urine receptical and make sure that is closed off.

SC We're rechecking those now. (garbled)

SC Yes, Fred, I did that and even closed the waste managment dump. Just to see if myrtle was leaking but it didn't do any good.

CC Okay.

CC 14, Houston.

SC Go ahead Houston.

CC Okay. Seen anymore venting over board at this time.

SC That's affirmative, Fred. I was just sitting in here watching it just ... it comes in spurts. Just about 30 seconds ago we got a nice splash and there's some right now. It looks like it's coming, you know from over in the area of the normal dump.

CC Alright.

CC 14, Houston.

SC Go ahead.

CC The option flow looks like it settled there .4 and then all at once it started ... it jumped up there just a half a minute ago or so. And, it looks like it's back down again. Have you moved anything else in that area?

SC Yes, Fred. We went back cleaning up after that malfunction, and we had the water glycol valves off and the emergency rigs and we didn't see any effect when we went through it. And, then we just went and opened them up again, hear.

CC Okay.

SC It's settled down on our meter at .6 pounds an hour now, Fredo.

CC Okay.

CC 14, Houston.

SC Go ahead, Fredo.

CC Say, I guess we're happy with that 02 flow you got now. It looks pretty stable, and the vehicle rates look okay to crank up a PTC again. We think we've got a handle on what happened except that what really caused the first (garbled) 02 flow high. I say something's readjusted.

SC I don't know that we can have a good answer for you. Stu and I just talking about we think quite possibly the urine dump is leaking. We got it cycled now and shut clear off. Let's see if that helps any.

CC Okay.

CC 14, Houston. We'd like to OMNI BRAVO.

SC Okay.

SC Houston, this is Al. We're going to read the checklist now. We thought we'd drop off a little bit early tonight.

CC Okay.

SC Houston. We're bringing direct 02 valve on to pump the cabin up to 57 now.

CC Okay.

CC 14, Houston.

SC Go ahead Houston.

CC We can figure down here to take the memory dump. Stand by one I'm going to check the omni.

SC Okay, Fred. We ought to have you now. How do you read?

SC Houston, 14. How do you read?

CC Okay. Loud and clear, Stu, stand by one.

SC Okay.

CC Okay. We're ready now, Stu, for the E memory. They're all set.

SC Okay.

SC Houston, the onboard rebounds are ready to copy.

SC Okay, Fred, here comes the merve 74.

CC Now, okay.

END OF TAPE

CAPCOM Houston onboard rebound crew.

SC Okay, Fred, here comes the first 74.

CAPCOM Now, okay. Go ahead, Ed.

SC Okay, that be 37. I don't know about 80 37 45, how about B 37 45, RCFA 88, B 90, C 87, D 91.

CAPCOM Okay.

PAO This is Apollo Control. The crew of Apollo 14 at the present time is going through their pre-sleep check list, a little earlier than scheduled in the flight plan. Spacecraft now being tracked now through the Madrid tracking station of the deep space network. The crew had earlier called and said they wanted to go to sleep a little earlier and prior to that they were a flurry of questions back and forth about spurious high flow rate of oxygen in the command module, higher than normal that is, not excessively high, caused by some valve being open perhaps in the waste management system. Apparently it seems to have settled down. And the spacecraft seems to be in a good solid steady roll rate for passive thermal control. They passed up their onboard readouts of consumables. Battery amp power is remaining percentages of RCS propellents. Right now Apollo 14 as shown on the space digitals display, as being 71 887 nautical miles out from Earth, velosity now 6570 feet per second. We'll leave the air ground circuit up for a while longer until it appears that the crew has settled down for the sleep period. At 15 hours 24 minutes ground elapsed time, this is Apollo Control.

END OF TAPE

SC Houston, do you read 14?

CC Go ahead 14.

CC Go ahead 14, Houston here.

CC Apollo 14, Houston, do you read?

CC 14, Houston, do you read?

SC Houston do you read 14?

CC 14, Houston. Read you loud and clear.

SC Hello, Houston. How do you read 14?

CC 14, Houston, how do you read me?

SC Oh, you're loud and clear. There was a lot of static and no reception on, I guess that other antenna.

CC Okay, we had to drop Madrid and try to reacquire there to get you back. Could you varify that you are on OMNI BRAVO, there, Stu?

SC That's affirmative, OMNI BRAVO

CC Okay.

CC And if you don't have anything else for us, we're about to secure here.

CC Standby one, Stu.

CC 14, Houston.

SC Go ahead, Houston.

CC Just one more thing we'd like to confirm the H2 bands off.

SC Okay, well they were on, they're off now, Fred.

CC Roger, Stu, guess you can take the rest of the day off.

SC Okay.

PAO This is Apollo Control at 15 hours 47 minutes ground elapsed time and apparently the crew of Apollo 14 has retired for the night. That last conversation between Stu Roosa and spacecraft communicator Fred Haise here in Mission Control. The flight surgeon on the Gold team Dr. Willard Hawkins said he couldn't really tell yet from his biomedical data at his console who was asleep yet. He said it appears that spacecraft Commander Shepard's now nearing sleep status but he couldn't really tell. We'll take down the air to ground circuits and if there are any further conversations after the sleep period which has now begun, we'll play those back on a delayed basis from tapes. Present position of the spacecraft 73 420 nautical miles out, velocity 6 476 feet per second and at 15 hours 48 minutes ground elapsed time, this Apollo Control.

END OF TAPE

APOLLO 14 MISSION COMMENTARY, 2-1-71, 7.10am cst, 88/1

CAPCOM 14, Houston.

SC Houston, you're go, 14.

CAPCOM Roger. One last thing. Looks like may be an 02 tank number 1 heater on. Should be number 1 and 2 OFF; number 3 on AUTO.

SC Okay, 3 is AUTO and 1 and 2 02 tanks are OFF.

CAPCOM Okay. We'll leave you alone now.

SC Okay.

END OF TAPE

PAO This is Apollo control, 16 hours 57 minutes GET time. Crew has been asleep now for at least, that is we have'nt heard from them in about the last hour. The schedule 10 hour sleep period which may run alittle bit longer since they did go to bed earlier. Apollo 14 now 77,595 nautical miles out from earth, traveling at a velocity of 6,231 feet per second. The latest status report from the space craft analysis room in the back of the building here, for GET time of 16 hours, it apears as the earlier report. It came out all systems normal, no change in status. One brief mention of the fluctuation and oxygen flow rates, which occured shortly before the crew went to sleep, were some of the waste management valves have apparently had to be recycled to return the oxygen flow rate to its normal rate of something around 3/10 of a pound per hour. Battery B in the command module was taken off charge, at about 13 and 1 half hours GET time. All batteries are topped off now to rated value. Fuel cells in the service module, fuel cell 1 is hot putting 24 amps as is number 2 and number 3 is putting out 28 amps. Cryogenic storage system hydrogen and oxygen in the service module all showing nonimal values of quantity remaining. Fluid temperatures in the percentage of quantity oxygen tank number 1 is 92.6 per cent remaining, oxygen tank number 2 is 93 per cent, oxygen tank number 3 is 57 per cent. Number 3 is the tank that was added after the Apollo 13 incident and of course the plan is to use from it first and then go to the other 2 tanks. Hydrogen tank number 1 has 90.98 per cent quantity remaining, Hydrogen tank number 2 89.11 per cent. At 17 hours GET time the mission of Apollo 14, this is Apollo Control.

End of Tape

APOLLO 14 MISSION COMMENTARY,2/1/71,0900CST,MC-90/1

PAO This is Apollo Control, 17 hours 57 minutes GET. It's been slightly more than 2 hours since we last heard from the crew of Apollo 14 in the midst of a sleep period, well deserved. Apollo 14 presently 81 112 nautical miles out from earth. Velocity 6038 feet per second. Rather quiet here in Mission Control as the Gold Team nears the end of its first shift in this mission. At 17 hours 57 minutes GET, this is Apollo Control.

END OF TAPE

APOLLO 14 MISSION COMMENTARY, 2/1/71, 09:12, MC-91/1

PAO This is Apollo Control, 18 hours 8 minutes ground elapsed time. An announcement of local interest here in manned spacecraft center are newsmen covering Apollo 14, a briefing on the space shuttle program which had been scheduled for 9:30 Monday morning, that's today, has been slipped until 1:30 p.m. in the small briefing room in the news center. The major participant in this briefing will be Charles W. Mathews, Deputy Associate Administrator, Office of Manned Spaceflight, NASA headquarters. To repeat, this briefing has been rescheduled to 1:30 p.m. today in the small briefing room, not at 9:30 as previously announced. Apollo 14, meanwhile, now 81,826 nautical miles out from Earth, going in an even 6000 feet per second. At 18 hours, 9 minutes ground elapsed time this is Apollo Control.

END OF TAPE

APOLLO 14 MISSION COMMENTARY, 2-1-71, 9:40am cst, 92/1

PAO This is Apollo Control, 18 hours 37 minutes ground elapsed time. Apollo 14 crew still asleep at this time. The clock on the front screen of Mission Control, here, showing an awake time 7 hours 22 minutes from now. Some velocity and distance figures: distance out from earth, 83 399 nautical miles; velocity 5917 feet per second. To recap the past 7 or 7-1/2 hours of the Gold Team tenure here in Mission Control: The - shortly after the shift of Flight Controllers under Flight Director, Jerry Griffin came in, the crew was given a GO to set up the passive thermal control, the barbeque mode of stabilizing the thermal response of the spacecraft by rotating about its X-axis. This took a little while to set up and they had to make two attempts at it. Roosa asked if it wouldn't be alright to stow the probe, which had been under examination in the spacecraft back in the tunnel attached to the drogue and Ron agreed that was the ideal place to stow it rather than have it rattling around in the cabin. All attempts onboard the spacecraft and here in Mission Control with the training model of the probe and drogue to duplicate the malfunction of the latches' failing to engage - all these attempts failed because it worked every time. The crew requested that they go to sleep earlier than called for in the flight plan and they started their sleep period at about 15 hours 30 minutes ground elapsed time with a brief exchange of conversation between Stu Roosa and spacecraft communicator, Fred Haise about 15 minutes afterward. Prior to going to sleep, there was a brief flurry of high flow rates in the oxygen system in the spacecraft environmental control system. It was discovered that it was caused, perhaps, by the valves in the waste management system bleeding the pressure overboard and causing higher flow rate in the oxygen system. But this was corrected without too much difficulty. Passive thermal control was set up. The crew made their consumables report of propellants remaining, the amp hours in the batteries, all the usual standard stuff called for in the flight plan prior to sleep, and that they did begin their sleep period at ground elapsed time of 15 hours 30 minutes. And at 18 hours 40 minutes ground elapsed time, this is Apollo Control.

END OF TAPE

PAO This is Apollo Control at Houston at 19 hours 31 minutes now into the flight of Apollo 14. Our displays in mission control presently show Apollo 14 at a distance of 86 406 nautical miles away from earth and now traveling at a speed of 57 065 feet per second. In the mission control center we're in the process of shift change over. The Pete Frank team of orange flight controllers replacing Jerry Griffin, or Jerry Griffins gold team, as has been previous reported. The Apollo 14 crew is in a rest period. We now show a wake-up time 6 hours and 28 minutes away. In the, over the news room television monitors at 11:35 central time, there will be a replay of the television transmission that occured at 11 hours 6 minutes GET. This transmission ran 1 hour 5 minutes. We repeat in the, over the news center television monitors, there will be a reshowing of the television transmission that occured at 11:06 GET and ran for 1 hour and a half minute - 1 hour and 5 minutes. This will be at 11:35 central time. We're at 19 hours 33 minutes into the flight and this is Apollo Control Houston.

END OF TAPE

APOLLO 14 MISSION COMMENTARY, 2/1/71,1135CST, MC-94/1

z PAO This is Apollo Control Houston, at 20 hours 32 minutes now into the flight of Apollo 14. Our displays now show Apollo 14 at a distance of 89 728 nautical miles away from earth, and travelling at a speed of 5603.7 feet per second. The surgeon reports the three crew members, Shephard, Roosa, Mitchell are sleeping quite soundly. We shall remain in sleep time of five hours 27 minutes and at this time we'll take down the release line to replay the television transmission of early this morning - of early this morning, and this will be available on the monitors in the news center. We're at 20 hours 33 minutes and this is Apollo Control Houston.

END OF TAPE

APOLLO 14 MISSION COMMENTARY, 2-1-71, 12:43, MC-95/1

PAO This is Apollo Control, Houston at 21 hours, 41 minutes now into the flight of Apollo 14. We presently show the 14 spacecraft at a distance of 93,355 nautical miles and traveling at a speed of 5435 feet per second. As the rest period for the crew continues the Flight Control team here at Mission Control will be considering possible flight plan changes or updating the flight plan both for the balance of our shift and the next shift to come on. The crew wakeup time now shows that it's 4 hours, 18 minutes away. We're 21 hours, 42 minutes into the flight. This is Apollo Control, Houston.

END OF TAPE

APOLLO 14 MISSION COMMENTARY, 2-1-71, 13:14 cst, 96/1

PAO This is Apollo Control, Houston, at 22 hours and 12 minutes now into the flight. We now show Apollo 14 at a distance of 94 979 nautical miles away from Earth and that it is traveling at a speed of 5362 feet per second. During this quiet period while the crew is resting, a replay of last night's docking is being rerun on one of the - on the screen here in Mission Control. A space shuttle news conference featuring Mr. Charles Matthews is scheduled to be held in the News Center briefing room at 1:30 pm - about 15 minutes from this time. We're at 22 hours 13 minutes into the flight and this is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control Houston at 23 hours 23 minutes now into the flight of Apollo 14. Our displays presently show Apollo 14 at a distance of 98 566 nautical miles out from earth, and traveling at a velocity of 5205 feet per second. The crew of Apollo 14 is continuing with their rest period, however, our Flight Surgeon advises that the Lunar Module Pilot, Ed Mitchell plugged in his biomed at 22 hours 50 minutes. This would assume about 7 hours of sleep time. Meanwhile, we have preliminary times, distances and velocities of certain milestone events enroute to the moon. These are preliminary times, distances and velocities. The halfway in distance in terms of time, that would be at a ground elapsed time of 27 hours 4 minutes 42 seconds. The altitude would be 109 172 nautical miles. The velocity, relative to earth is 4779 feet per second. Velocity relative to the moon 3694 feet per second. Halfway in terms of time - this from liftoff to lunar orbit insertion. The time would be 40 hours 56 minutes. The altitude, relative to the earth, 142 119 nautical miles. The altitude relative to moon 81 723 nautical miles. A velocity relative to the earth, 3601 feet per second. The velocity relative to the moon, 3261.7 feet per second. Sphere crossing time, when we cross from the earth to the lunar sphere of influence 66 hours 3 minutes 7 seconds. The velocity match -when the velocity of the moon equals the velocity of the earth at the ground elapsed time of 47 hours 43 minutes. The velocity reading at that time, 3214 feet per second. With regard to the S4B, the present forcast time of impact, 82 hours 37 minutes 10 seconds. The velocity at impact 8347 feet per second. Present predicted coordinates 9 degrees 2409 minutes south 25 degrees 600 west. We also would like to advise all news men that there will be a briefing, a News Conference on Apollo 14 mission status in the big auditorium at 3 o'clock. Participants include Rocco Petrone, Apollo Program Director, Chet Lee, Apollo 14 Mission Director, Jim McDivitt, Apollo Spacecraft Program Manager in Houston and Sig Sholberg, Director of Flight Operations at the Manned Spacecraft Center. We repeat that the Apollo 14 Mission Stautus News Conference at 3 o'clock in the big auditorium of Building 1. We're at 23 hours 28 minutes into the flight and this is Apollo Control Houston.

END OF TAPE

PAO This is Apollo Control, Houston at 23 hours 42 minutes now into the flight of Apollo 14. Apollo 14 presently 99 thousand 5 hundred and 21 nautical miles away from earth, and traveling at a speed of 51 hundred 65 feet per second. We would like to repeat our earlier announcement that Apollo 14 mission status news conference will be held at the big auditorium of Building 1 starting at 3 pm. Participants will include, Mr. Rocco Patrone, Apollo Program Director, Colonel James McDivitt, Apollo Spacecraft Program manager at the manned spacecraft center, Mr. Chet Lee, mission director for Apollo 14, and Mr Sig Sjoberg, the manned spacecraft centers director of flight operations. We're up to 23 hours 43 minutes, and this is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control Housten at 24 hours 58 minutes into the flight of Apollo 14. At present we show Apollo 14 at 103 220 nautical miles from earth. Present velocity now reads 5012 feet per second. While our clocks are continuing to countdown, it shows the rest period ending at 1 hour 1 minute from this time. This is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control, Houston at 25 hours, 41 minutes now into the flight. Apollo 14 now 105,282 nautical miles away from earth and traveling at a speed of 4929 feet per second. The present plan in Mission Control is to not contact the crew of Apollo 14 until 27 hours ground elapsed time. One hour later than the flight plan calls for. Even if the crew should awaken and be about and in contact with Mission Control via voice communication the flight plan will effectively in certain areas move back by one hour. All of the activities presently listed in the GET is between 26 and 27 hours would move back one hour. The launch vehicle systems debriefing would move back to start at 28 hours ground elapsed time. The P23 cislunar navigation star sightings scheduled in the flight plan to start at 28 hours, 30 minutes have been deleted. The purpose of this to conserve on the reaction control system propellants. The Delta-V test and no Bias check and the P52 platform alinements have been delayed until 29 hours, 10 minutes ground elapsed time. The passive thermal control exit has been delayed until 29 hours, 45 minutes ground elapsed time. So the crew will in effect have an extra hour of rest. We're now at 25 hours, 43 minutes into the flight and this is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control, Houston. We're picking up conversation with the crew at this point and we'll switch to that conversation.

SC Apollo 14.

CAPCOM Roger, Apollo 14. Good evening.

SC Good morning, how are? Or is it afternoon?

CAPCOM I'm fine. How are you up there?

SC We're just great, thank you. We're up and brushed our teeth and shaved and we're just looking forward to a fine day.

CAPCOM Roger, Ed. We saw somebody get up and walk in his sleep and work the DSKY there about an hour ago.

SC Yes. That's right.

SC Just need to get a little practice, Gordon.

SC You just had a restless finger.

CAPCOM Okay. We've got a site handover coming up in about a minute and a half.

SC Roger. We'll wait for that and then I'll go ahead and give you the complete propulsion checks - the post sleep checklist.

CAPCOM Okay, Ed.

SC Houston, 14.

CAPCOM Go ahead, Ed.

SC I have the dosimeter readings for you.

CAPCOM Okay. We've handed over and I'm ready to copy here.

SC Okay. - -

PAO What - -

PAO Apollo Control at 26 hours, 3 minutes. You heard that conversation with - those conversations with the crew. The crew sounding alert and wide awake. The launch vehicle debriefing time will not be changed, however, it it appears likely that other events in the flight plan pre-ceeding that may very well take place at the leisure of the crew. We're at 26 hours, 4 minutes into the flight. We show Apollo 14 at a - -

CAPCOM Houston.

SC Okay, Houston. I read you now.

CAPCOM Roger. I think we rotated between a couple of antennas here. Got you loud and clear now.

SC For my sleep, I slept about 4 hours straight and then another 2 or three intermentally and I feel very good.

CAPCOM Roger.

SC - - about the same for me and feel - -

CAPCOM Al, this is Houston. You're very very weak. Would you repeat?

SC Okay. I had a sleep cycle of about the same for me.

SC Slept soundly for about 4 or 5 hours, and then intermittently for another 2 (garble).

CAPCOM Roger, Al. For some reason you're not nearly as readeable as Ed is and it sounds like - well I guess I can't really say what the problem is there on your mike. I'm getting alot of - of interference when you start and stop the transmission, yet no suggestion on what to do to improve it.

SC Okay. How do you read me?

CAPCOM That's alot better, Al.

SC Okay. (garble) Did you get the status report?

CAPCOM I think we got it. 4 to 5 hours good sleep and a little bit intermitant after that, is that about it?

SC (garble)

CAPCOM Al, you're still breaking up. Really can't give you a good description of what is wrong, but you're just not very readable.

SC Okay. Stand by Houston. We'll work on it.

CAPCOM Okay, Ed.

SC And Houston. I'll go ahead and start charging BAT A with your concurrence and we have changed the LiO canister.

CAPCOM Roger. That's affirmative. You can go ahead with that and also give us the LM, CM Delta-P as shown at the 27 hours there when it's convenient.

SC (garble)

SC And Gordon, it's Stu (garble).

CAPCOM Read you loud and clear, Stu.

SC Okay. I guess on my sleep I'll split it with you about half. I'll say I got about 5 hours.

CAPCOM Roger.

SC My matress was hard.

CAPCOM Rog. When you're ready to copy I have words on some changes we've figured out for the flight plan.

SC Do it in about a minute.

SC Okay, Houston. Go ahead with your changes in the flight plan.

CAPCOM Okay. Before we start one reminder is that when you went to sleep we didn't get any pre sleep checklist. If there was anything out of the ordinary there well, - pre sleep report that was and we'll take any - - Stand by, I'm getting some words from the surgeon here. Okay. Just disreguard it. We'll need the - both the pre and post sleep reports from here on out. Okay on the flight plan if you're ready.

SC Okay. Go ahead.

CAPCOM Roger. We're going to delay

CAPCOM the launch vehicles systems debriefing until 28 hours. And the P23, which is scheduled at 28, 30 we're going to cancel, which will save us some RCS. Along that line the results of the last P23 that Stu did, the horizon that he shot at was 28 plus or minus 5 kilometers and that's right on the pre flight values so an update will not be required, and your average error for pointing error was 3 odd minutes which rank - is right in there with the best ever recorded and the expert gives you a pat on the back, Stu and said it was an outstanding job.

SC By Jove. Thank you, Gordon.

CAPCOM Okay. On with the flight plan. The Delta-V test and nul bias check and the P52, we're going to delay that until 29, 10 GET.

SC Okay. So far I have that we do the launch vehicle debriefing at 28 hours and 27 hours. We're delaying nul bias and the P52 from 28, 10 to 29, 10, we're cancelling the P23 at 28, 30.

CAPCOM That's affirmative, Al. And then further after that we're going to delay the exit of PTC until 29 and 55 and when we do exit PTC, go right into the mid-course 2 pad attitude.

SC Okay. PTC to 29:55 and (garble) mid-course 2.

CAPCOM Roger. And on all other activities will be nominal except on waste water dump we want you to dump to 0 percent quantity.

SC Okay. Dump the waste water to 0.

CAPCOM Okay. We have one additional question for the launch vehicle system for this performance debriefing. We can either give it to you now so you can think about it or wait until you get around to it to give it to you. Your choice.

SC We'll take it now.

CAPCOM Okay. The question is, you announced during the docking attempts that you thought the booster was maneuvering a little bit. We'd like you to expand - -

END OF TAPE

CAPCOM The booster was maneuvering a little bit. We'd like you to expand on the direction of the maneuver, the type of maneuver, lateral or oscillating or any other words to that affect. The approximate time the maneuver was first observed, whether it was before the first docking attempt between the 1st or second or if you can relate it to any other activity. Any observed vents from the launch vehicle during the maneuver, and anything else unusual or unexpected that you noticed, over.

SC Okay question number 10, describe type direction and the time relation to the booster maneuvers during docking, and any events that we noticed during the maneuvers.

CAPCOM Roger, and I was just thinking as I read it that on that time, we can probably go back on the tape and find out when you mentioned it as far as tying down the time accurately, that might be easier for us to get than you.

SC Okay, that would probably help us, thank you.

SC Hey, that's no sweat Gordon. I remember the comment when I made it, and what the circumstances were.

CAPCOM Okay, Stu. I think that takes care of all the words they've got for you right at the moment.

SC Houston, 14.

CAPCOM Go ahead, Ed.

SC Our LM CM delta p is zero .3 and I'm standing by for a command module consumables update.

CAPCOM Roger, copy, 0.3. We don't have the figures on that update yet. One thing I didn't mention is, that we are planning to do a midcourse 2, as is shown in the flight plan and we'll do it such that it will require a clock update as scheduled at about 54 hours and 30 minutes in the timeline.

SC Okay.

CAPCOM It'll be roughly 40 minutes.

SC Looks like we -

CAPCOM Roughly a 40 minute -

SC Say again, Gordon. How much?

CAPCOM It'll be roughly 40 minutes, and I still haven't got used to which direction it is. Actually it's like going into Daylite Savings Time, it'll move your clock ahead.

SC Okay, Gordon, looks like we get to send that T EPHEM update after all.

CAPCOM Right.

PAO Apollo Control, Houston, 26 hours 15 minutes. The midcourse correction 2 is scheduled for ground elapsed time of 30 hours 36 minutes 7 seconds with a

PAO delta v of 71.3 feet per second, performed with the service propulsion system engine, and burn duration of 10 seconds. This will force the trajectory to arrive at the moon on time, on time Greenwich Mean Time, thus requiring the, the GMT liftoff update. We're at 26 hours 16 minutes continuing to monitor, and we show Apollo 14 at 106 915 nautical miles away, and traveling at a speed of 4865 feet per second.

END OF TAPE

CC Apollo 14, Houston. Over.
SC Go ahead, Houston.
CC Ed, I've got that consumables update now if you're ready to copy.
SC Alright. Go ahead.
CC Roger. GET 2600 RCS total 86 quad A 85 quad BRAVO 86 quad CHARLIE 86 quad DELTA 87 H2 tank 1 87.98 percent. H2 tank 2 85.7 percent, 02 tank 1 93.4 percent tank 2 92.6 percent, tank 3 54.6 percent. Over.
SC Okay, I read back. GET at 26 hours RCS total 86 percent, quad A 85, B 86, C 86, D 87, hydrogen tank 1 87.98, 2 85.7, oxygen 1 93.4, 2 92.6, 3 54.6.
CC Roger, Ed. Your readback is correct and we have had considerable discussion today about the docking probe. There are still 4 questions as a result of all these discussions that we would like to put to you the crew. It'll probably take some discussion to answer them. There's no hurry. Don't let us interrupt breakfast there. When you're ready we'd like you to take these questions and comment on them.
SC Okay, Gordon. We'll probably be done here in another 45 minutes and we'll jump right into that one then.
CC Roger.
PAO This is Apollo Control Houston at 26 hours 37 minutes now into the flight of Apollo 14. We now show the spacecraft at a distance of 107 892 nautical miles traveling now at a speed of 4827 feet per second. In approximately 20 minutes we will have a shift change here in Mission Control. The Maroon shift replacing the Orange shift of Flight Controllers. The orange team headed by Pete Frank that came on duty at about 19 hours GET. Until the last hour when Mission Control, in fact, received a call from the crew, Mitchell, Roosa and Commander Al Shepard had spent almost this entire time in a rest period. In the Mission Control Center our flight plan update was in progress for a better period of the time. The plan as it evolved, did not plan to awaken the crew until 27 hours GET, but the crew woke up almost per flight plan schedule. Commander Al Shepard reported 7 hours deep and intermittant sleep as did Lunar Module Pilot, Ed Mitchell. Stu Roosa reported some 5 hours sleep time. As we look ahead to the next shift, we also look ahead to the midcourse too - manuever and as we had reported previously, that schedule for GET of 30 hours 36 minutes 7 seconds, with the delta V at 771.3 feet per second at a burn duration of 10 seconds. This will require a GMT liftoff update which effectively at some future point in the flight plan will move the GET clock here in Mission Control up about 40 minutes. Because of the absence of activity with the crew on this shift, there is no plan for a change of shift news conference. We're at 26 hours 39 minutes into the flight. We show Apollo 14 at an altitude of 108 012 nautical miles at velocity of 4823 feet per second. This is Apollo Control Houston

END OF TAPE

SC Houston, Apollo 14.

CAPCOM Apollo 14, Houston. Go ahead.

SC Say Gordon, do you have any choice news items for us today?

CAPCOM Guys, I think you all been making all the news. I haven't heard anything very significant and don't have any good summaries for you right now.

SC Okay.

CAPCOM Apollo 14, Houston.

SC Go ahead.

CAPCOM I have one story here I'll read from the front page of the Houston Post, this morning's edition. The headline is Mrs. Shepard ate an omelet during docking problem. In the first paragraph, it's dateline Cape Kennedy, Florida Mrs. Louise Shepard sat in her motel room eating an omelet while her husband and the two other Apollo 14 astronauts worked with a faulty docking latch that for a time threatened their moonflight.

SC They were sure calmer than we were.

CAPCOM Rog.

PAO That was Ed Mitchell who responded she was sure calmer than we were. We're at 26 hours 54 minutes into the flight of Apollo 14 now 108 668 nautical miles away from earth. The present velocity now 4798 feet per second.

PAO This is Apollo Control at 27 hours 7 minutes. We've completed the Change of Shift handover here in Mission Control. Flight Director Milton Windler now sitting at the Flight Director's console replacing Flight Director Pete Frank. Our Capsule Communicator on this shift will be astronaut Bruce McCandless. At the present time Flight Director Windler is going around the room checking the status with each of his flight controllers and reviewing the overall mission status. Apollo 14 at this time is traveling at a velocity of 4773 feet per second and we've continued to watch that velocity to drop off. The current spacecraft altitude is 109 301 nautical miles. One of the principal items that this shift will be concerned with is midcourse correction 2. A midcourse correction aimed at targeting the arrival point of Apollo 14 at a preplanned ground elapsed or Greenwich mean time at an altitude of about 60 nautical miles above the surface of the moon. The planned time of that maneuver is at a ground elapsed time of 30 hours 36 minutes 7 minutes and the midcourse correction will change the perigee or the high - the low point of passage around the moon from 2100 nautical miles to the targeted 60 nautical mile altitude.

SC Houston, Apollo 14.

CAPCOM Apollo 14. This is Houston, your friendly

CAPCOM maroon team on station, go ahead.

SC Well hello Bruce. How you doing today.

CAPCOM Okay Ed. How about yourself?

SC Great, thank you. Bruce these questions that are being proposed on the probe operation, should I copy them or shall we just let you go ahead and talk about them then we'll get back to you.

CAPCOM Well I think probably the easiest thing to do would be to start going through them one at a time and if you feel like you need more time to discuss it or to recall it, the exact things you went through, why we can just take the time as we go along. There's no big rush on it. It'd probably be easier than your trying to prepare write a formal report or something and it down.

SC Okay.

CAPCOM And we're just finishing up - -

SC It'd be a little while before we're ready to go that way.

CAPCOM Okay. We're just finishing up the Change of Shift Briefing down here and it'll probably be 5 or 10 minutes at least before we're ready to roll on it too.

SC That's good.

SC Hey Bruce. Did you get a good night's sleep? You put in a hard day yesterday.

CAPCOM Yeah. I got up about 1:30 or 2 o'clock this afternoon. It felt real good.

SC Rog.

SC We're happy to discover there really is a (garble) after all. We're constantly reminded of - -

END OF TAPE

SC After all. We're constantly reminded of it.

CAPCOM That there really is a what, after all?

SC (garbled)

CAPCOM Yea, how about that, that's a beautiful one.

SC Hey Bruce, would you pass on to Ray, that it was not 100 percent at the bench check.

CAPCOM That's to Ray, that it was not 100 percent at the bench check. You mean the the equipment loaded on board was not completely represented at the bench check?

SC That's affirmative.

CAPCOM We've got the back up crew -

SC I don't know why -

CAPCOM We've got the back up crew commander standing here monitoring the system.

SC We seem to be finding a few things around that we didn't see at our bench check, and a few crew preference details.

CAPCOM Yea, How was breakfast by the way.

SC It was great. I ate every scrap.

SC Hey, it sure was.

CAPCOM Yea, and I found my headset all right this morning too, but there was a little difference from last night.

SC Okay, you keep us posted on that headset.

SC Houston, 14.

CAPCOM Apollo 14, this is Houston. Go ahead, over.

SC We're standing by for the booster launch phase discussion and the drogue discussion any time you're ready to go.

CAPCOM Roger.

PAO This is Apollo Control at 27 hours 44 minutes. You heard Al Shepard ask the capcom whether or not we're ready to proceed with the continuing analysis of the probe, and we are preparing to proceed with that analysis. Last evening, on this shift, a series of 12 questions were forwarded to the crew after removing the probe in a preliminary analysis. We'll be picking up where those 12 questions left off, with a series of additional questions, and with additional Apollo program and NASA management officials here in the control center to participate in the evaluation.

SC 14 -

CAPCOM Go ahead 14.

SC Say Bruce, how far away is S4B from

SC us?

CAPCOM Stand by I'll see if I can get you a figure on that.

SC Yea, and on the same subject, have you got any, say give us a roll angle during PTC and some place to point the optics. I wonder if we could see it.

CAPCOM Okay, I'll see if we can get that.

PAO Among the interested officials here in the control center at the present time, who will be participating in this probe evaluation are, Apollo program director, Rocco Petrone, Donald K Slaton, Director of Crew Operations, Manned Spacecraft Center, Sig Sjoberg, Director of Flight Operations at MSC, and Apollo 14 back up commander, Eugene Cernan, also astronaut Tom Stafford has just walked into the control center and is at the capcom console at this time. This is Apollo Control at 27 hours 48 minutes. Apollo 14 now traveling at a velocity of 47 hundred 4 feet per second, and we show the spacecraft, 1 hundred 11 thousand, a hundred 59 nautical miles from earth. In addition to those officials here on the floor of the control center, we also have Doctor George Low, acting NASA administrator in the viewing room, and Charles Mathews, deputy associated administrator for manned space flight along side Doctor Low in the viewing room. We have a series of 4 planned questions, which will be asked the crew, in addition to follow up questions I'm sure that their responces will illicit.

CAPCOM 14, this is Houston.

SC Go ahead.

CAPCOM Roger, we'd like to pick up the discussion on the docking probe situation now, if you're ready.

SC Okay, stand by just one here.

SC Okay, Bruce. I guess we're all hooked up and ready to go.

CAPCOM 14 this is Houston, go ahead.

SC Rog, I think we're all hooked up and ready to go.

CAPCOM Roger, this number 1 question is, was there ever more than 1 bottle selected on the docking probe, and if so, which one's?

SC That's negative we used primary one, and that's the only one we used.

CAPCOM Roger, very good.

CAPCOM How many times was the extend release position of the docking probe extension retracting switch operated, and when and about how long was it held in these positions, over.

SC Well, it was operated per the flight plan for the initial extension, and the contacts worked normally and we felt a jar, a good solid thump, but it went on out and then it was not operated again until after the problem started. At the ground's suggestion we went to extend release, and then back to retract, I think twice, no more than twice.

CAPCOM Okay, so, grand total, I guess we could say that you've had three cycles to the extend release position, the nominal one and the two were after the problem started developing? Is that correct?

SC Let's call it no more than 4 Bruce. We did one on our own, so one normal and no more than 3 additional.

CAPCOM Roger, we copy.

SC And Bruce no response at all except for the first one, which went normally.

CAPCOM Okay, on the first one there you were actually causing the probe to extend, were you not?

SC That's affirmative, we extended it, and as Al said we heard her clunk in and the talk backs did their thing, flashed barberpole and then went back to gray, as advertised.

CAPCOM Okay, then on the subsequent ones about all we'd be operating is the capture latch docking motor.

SC Okay.

CAPCOM They probably wouldn't feel that in the form of a mechanical shock or anything like that. And -

SC Rog.

CAPCOM You may want to kick this next one around before you answer us on it and make sure you got all the details lined up. We'd like you to go through the procedure in as much detail as you can on the final docking

END OF TAPE

CC go through the procedure in as much detail as you can on the final docking, including the switch position, torque back indications, the dynamics, the order of your contact with the LM drogue, the plus X thrusting, barber pole, the bottle selection and the actual probe retraction. I think you mentioned yesterday that you had a 3 second delay in probe retraction and we'd like to know when that 3 second delay was measured starting that is from throwing the switch or from some other event. Over.

SC Okay. I'll start it by saying that all the switches were per checklist. And of course those were the first things that we verified when the problem occurred. At your suggestion as well as our own. Everything was normal up to the point where Stu made his first contact. I'll let him take it on in from there.

SC Okay, Bruce, why don't we just back up a little bit, and you asked for the specific one where we got the docking bit. Let's go back to the first one and everything looked just real fine coming in on it. I'd say the whole docking operation was just so much like the CMS that it was hard to believe. I mean the procedures and the view and the response. The vehicle, and I'd say I had 2 tenths of a foot per second closing speed. And then, the reaction when I hit the drogue was just exactly like the - you know the docking trainer that we had where you didn't hit the catch relatches, but you just went in and banged into the drogue?

CC Roger. Over there in building 5.

SC Yes. That's the exact response I got on the first one. I klonked into it and - you know - and then I could tell that I was slipping out and of course Al didn't call the barber pole. So at that time I did the natural thing and jabbed it with a little plus X, and drove ito the drogue and we were lined up good. I held it in plus X and the alinement - you know - was still good on the target just like you can do in the docking trainer. Okay, and then I realized that it hadn't made contact so I let her back off. At that time we called you, and I said, well, I'll try it again. And I increased the velocity. And on this one I'm estimating that my contact velocity was about a foot per second. It might have been a little less then that. As you know, a foot per second, closing looks like you're going to run right through the thing so, but I would - I've looked at a lot of these on the simulator and I would say that probably the second one was right at a foot per second. And I got the same response - and I really can't remember if that's the one where you told me to try plus X after I hit or not. You know, I had already done that on the first one, but anyway, if this was the one, then I hit - you said oh 3 seconds, I held 4, and no luck at all. We came back out. At that time, I suggested we fall back, regroup and talk about it. And then you pretty well know

SC the story then. You suggested that we try it again with everything normal, and I guess the second time there I contacted and that was not the time I held the plus X. It was the next one on your suggestion. Yes, the second one I did it on my own and the third one you said, let's try a normal docking and hold 3 seconds and I did that and held 4. And also, it was after the second docking that I noticed the radial scratches and at that time that's when I became convinced that from the action and then seeing the scratches that the docking latches were not giving, and were indeed locked instead of the cocked position. Okay, so we went through that one as you suggested and I held plus X 4 seconds and - we're right in the drogue and holding steady. And then we came out and down to - to the last time -

CC Stu.

SC I came in I'd say about a tenth maybe .15 in that area .2 maybe a little less, contacted it and at contact, the attitude stayed fairly good. There was maybe a degree and a half, maybe 2 degree pitch up movement on the COAS. I then applied a plus X and held it. At that time it put it in the center of the drogue and the COAS and the reticle and the translation were all just looking real good and so I gave the cue to Al to retract and he hit the retract switch at that point. And then I'll let him take it from there.

CC Stu, before you press on. Where in this sequence of dockings, did you actuate the extend release switch position again. Over?

SC Okay, it would be after the second attempt. It was per your suggestion the ground suggestion and we went through the extend release - in through there - no wait a minute, we tried it ourself after the second one didn't we? Okay, the consensus here is after the first one, we went back to off and then back to retract. And then after the second one we went to extend and then back to retract.

CC Okay, and did you do anything with the extend retract switch after the last unsuccessful docking but prior to the final successful one?

SC I don't think we did, Bruce. We told you everything we did with that switch. (garble) from retract to off then back to retract again.

CC Okay, now. In going through this sequence, did you ever move the docking probe retract, that is the bottle select switch off of primary 1, that is did you recycle that switch or do anything in this sequence? Or did you just leave it in that position after you initially selected it?

SC Well we don't touch that switch until we get capture latches. We stay to the operation until (garble)

CC Okay. Roger. Copy.

CC Okay. So we're coming up on the final successful docking here and tell us that you get this 1-1/2, 2 degrees pitch up on the COAS that looked pretty good. You

CC applied plus X and held and I think that's where I broke in. Go ahead.

SC Okay, and then on the plus X then that brought the COAS right down and the alignment - then everything was fine and translation was real good all the way except like I say, for that - you know small pitch up a degree and half or whatever that was right at contact as the probe sliding into the drogue.

CC Okay, and then -

SC And when Stu called out retract I went to retract position on primary 1. And it looked pretty normal from there. Just long enough to say to yourself, well it hasn't worked, and then it went barber pole and then grey and simultaneously there we got the feeling that we had hard docked. So it's probably a 3 second time period from the time I went to primary 1 till I had barber pole and approximately a second after that to grey and the hard dock.

CC Okay. Stand by.

END OF TAPE

CAPCOM Apollo 14, Houston.

SC Go ahead.

CAPCOM Roger. Were you thrusting plus X all the time from initial contact until the time that you got the hard docking? Over.

SC That's affirmative, Bruce. Once I got her in the drogue - you know, we'd talked among ourselves and we told Al to hold on until I'm thrusting and I'm satisfied with the alignment. So when we made contact I thrusted and it looked like we were - everything was good and I held a positive plus X all the way until we got the latches.

CAPCOM Okay. From contact, when you started thrusting plus X did you feel anything after the initial contact that would indicate that you'd moved on in and seeded the probe in the center of the drogue. Specifically, do you feel that at the time that you selected retract, the probe head was in such a position in the drogue that you should have already been in a barber pole position on torque backs? Over.

SC Well, Bruce, the probe was obviously in the drogue, but - yes, there is no way of knowing, but the feeling amoung us here and - my feeling is that, no, I don't think we had capture latch lock until after we went to primary. Now, I - you know, I'm sure ya'll have looked at it and you've got people down there tearing the probe apart, but I don't even know if it's physically possible, but I don't feel that we had any capture latches in that hole until that last operation when we went to primary and drove the beauty in there.

CAPCOM Okay. Do you feel like the probe head was in such a position - do you feel like the position of the probe head changed on you any after you went to primary?

SC No. No. I was watching the LM - I was plus X-ing and Al called primary and we started closing on it and there was no movement, no - -

CAPCOM Okay. We copy. No movement after you started the plus X and got yourself seeded in there until such time as the bottle fired - that is, no more closing movement. Is that correct?

SC That's affirmative. As far as I can tell, we were there, thrusting, holding steady - - Okay, do you read me, Bruce?

CAPCOM Roger. Reading you loud and clear, Stu.

SC Okay. And - you know, we got sitting steady in the drogue, plus X, everything looking fine, we hit the retract switch and we start moving together. I didn't hear anything or see any action until we heard the latches close.

CAPCOM Roger. But while you were sitting there the talk back was Grey and then 3 seconds after you went to primary approximately it went to barber pole and the nominal sequence started.

SC Well, I was looking at the talk backs and that's about the only thing we saw as we pointed out before, about 3 seconds after the initiation of the primary contact - on the primary contacts which were in the number 1 position, they went barber pole for perhaps a quarter or a half a second and then went grey simultaneously with the hard dock.

CAPCOM Roger.

SC Hey, Bruce?

CAPCOM Go ahead, Stu.

SC Okay. And on that one, now we sort of hasseled this out, I guess it's something we need - we're probably going to get to, but we - yesterday, you know, we called it a ripple fire and it felt like we had them all, which we did, but it really felt like the latches - we got a couple or, you know, it's hard to say how many, but we got some latches and then in some descrete time, maybe a quarter of a second or something like that, then we got the rest of them in a ripple. So, I think we got the docking latches in two distinct times separated by, you know, a very small amount, but at least it was enough to say it was not one continuous ripple fire.

CAPCOM Okay, Stu. We copy that and I guess one last point on this final docking sequence, did the closure of the two vehicles start when you selected the primary and continued for some period of time with the barber pole indication during this period of closure or did the flash to barber pole and then back coincide with the beginning of the closure for hard docking?

SC Hey, let's talk about that one for a second, Bruce.

CAPCOM Roger.

SC Bruce, let me give you (garble) cordinated on the way this happened. I saw it moving and as in previous attempts, we hit, moved just a little bit to true alinement as the drogue forced the probe toward the center. And we started to bounce, and it looked like we bounced - started to bounce back out. Stu hit the plus X thrust and held it for what appeared to be right in the drogue with thrust. He called a retract. Al hit the retract and a moment after that it seems like we started to move together. Al then called barber pole, called grey, and we were moving together continuously during this time and then I heard the fire go off of the latches breaking.

CAPCOM Okay. We copy that, Ed. Thank you.

SC No. We did not.

CAPCOM I wonder if you could comment on the

CAPCOM thrusting activity immediately after contact for each docking.

SC Okay. As I said on the first one I - was going along - -

CAPCOM We're referring more to nature of stable attitude control stabilization thrusting other than the plus X, I think you've pretty well covered the plus X for us.

SC Oh, that's the only thrusting that I did. That's all it took to aline it. I did no other movement either with the RHC or the THC after contact except plus X.

CAPCOM Okay. We copy that.

SC Bruce, the probe was sufficiently close to the center of the drogue on each of those contacts. I believe that the marks that we pointed out to you on television yesterday represent the initial contact to the probe. It could not have been more than an inch and a half or two inches from the center of the drogue at that time on any of the contacts.

CAPCOM It looks like Stu was right in there in the center from what we could see on the TV last night on those contacts.

SC That's affirmative. It looked the same way out the right window.

CAPCOM Apollo 14, this is Houston. In the process of making the docking yesterday, we advised you to check some circuit breakers, which you did. Did you at any time cycle any of these circuit breakers, that is open and then reclose them? Over.

SC Okay. All we did was check them. That's the group 4 and the docking drogue circuit breakers. I just checked them, you know, by pushing on them, but no, we did not pull any and then push them back in.

CAPCOM Okay. We copy. And that about winds up our queries on the docking probe situation. We'll be ready to go on the lauch vehicle debrief here in a minute or so.

SC Okay, Bruce.

SC Okay.

END OF TAPE

CAPCOM 14, Houston.

SC Go ahead, Houston.

CAPCOM Roger. Last night on the docking probe removal after you took the preload off the probe, could you tell whether the probe had - was in fact, locked into the drogue at that time or not?

SC (garble) - It appeared to be Bruce. I took the preload off. In fact Al made that question and we both looked up around at the probe head to see if we could see anything that looked unusual about it or whether it looked like it was out or anything and it did not. Everything looked normal.

CAPCOM Could you feel and tell whether the head of the probe was locked into the drogue or not?

SC No. I guess the answer to that would be we don't know. But now I guess as you've realized after I collapsed the probe it definitely was.

CAPCOM Okay. You say after you collapsed the probe, the head of the thing was definitely locked in there.

SC Yeah. It was hanging in there and I had to apply a little tug to get it out. I went right by the decal on the checklist and I think you asked at that time about the force that it took to bring it out and it appeared, you know, reasonably normal for the first time that I had done it in zero g. It didn't appear to be anything funny about it.

SC Bruce, let's make it clear. There's no question about the capture latches being through the drogue. But the question of whether they were locked or not is the one we don't know the answer to.

CAPCOM Right. That of course is the question that we were trying to get out here just now.

CAPCOM Apollo 14, this is Houston at G.E.T. of 28 hours and 30 minutes, you are approximately 1180 nautical miles. That's 1180 nautical miles away from the S-IVB. If you'd care to look for it, we suggest you use a P-52 program with a star code of 0 and load the following numbers in NOUN 88 if you're ready to copy.

SC Go ahead.

CAPCOM Roger. NOUN 88 values are 1 minus 31505 minus 87189 minus 37491. Readback. Over.

SC Okay. We'll plug in minus 31505 minus 87189 minus 37491.

CAPCOM Roger. Your readback is correct and we'll probably at the end of the launch vehicle systems debriefing here. Have some more numbers for you if you want to - if you don't acquire on this first pass.

SC Okay.

CAPCOM And we're ready to press on with the

CAPCOM debriefing. If you've got your flight plan handy you can just proceed down through the questions and we'll interrupt if we find anything that's unclear or if you prefer I can ask them to you, panel discussion type thing and you can answer back. Over.

SC We'll go ahead with the questions from the plan. Stand by one minute.

CAPCOM Roger.

SC Okay Houston. On question number 1 regarding the changes in noise level. The only change in noise level that we noticed was during the first part of the launch on the S-IC. When we had the initial noise of ignition and the build up in noise during max Q. And of course the associated (fade out)

CAPCOM 14, Houston. I think we're coming up on an antenna switchover for you. You seem to be fading down to the mud.

SC Okay.

SC Do you read me now, Houston?

CAPCOM Okay. We're reading you better signal strength wise Al. We still seem to be getting a little bit of break up from your comm carrier. Can you reposition the mike. See if that helps any?

SC Okay. Have the Mike right in front of my mouth right now. Is that better?

CAPCOM Roger.

CAPCOM I think we better take it from the top again.

SC Okay. Okay, from the top. The only significant change in noise level which we noticed in transmission due to the burning of the engine in the atmosphere. There is the ignition of course, build-up of noise there. And the noise level increased to max Q and then it dropped off. Other than that with respect to the noise itself we had no problem at all in our communications at any time during these stages of the flight. Are you satisfied with question number one?

CAPCOM That's affirmative. Press on.

SC Okay. Number 2. On the S-IC we noticed no significant changes in noise level and vibrations other than what we just discussed. SIC we thought - we felt was a fine ride nothing unexpected. The S-2 we noticed a change in vibration a sort of a slight pogo which started at 8 plus 40. Nothing of very great magnitude. And on the S-IVB to orbit burn we noticed no significant changes in the noise and vibration level. We noticed nothing unusual on S-IVB during TPI ignition. However, we did notice the beginning of a slight humm, low humm, or a buzz towards the end of the TLI burn. Question number 2 - any questions there.

CAPCOM We have no questions right now on that Al. We're closing our loop down here with the Huntsville Operations Support Center so it takes us a few seconds to a minute or so to get a response back. Why don't you press

CAPCOM on with the question number 3. If we get any queries, why we'll reopen the previous ones.

SC Okay. And number 3 - nothing unexpected in the way of transients (garble) as a matter of fact it went pretty much according to the way we had expected it. Through all the events mentioned in question 3 that is ignition and staging, engine shutdown, MR and so on. We did expect a little more abruptness with a cut off of SII. The SII SECO I think we came on maximum more than we expected. Otherwise everything was pretty much the way we kind of planned them. Question 3.

CAPCOM Roger. Question 4.

SC Okay Stu is ready for you on question 4.

SC Okay Bruce. I got a good look at that shroud. Of course, station keeping with the S-IVB you couldn't see all of it but as we moved around you could see a good portion of it back around behind the LM and everyplace that I could see and Ed also and Al - Al was looking through the hatch window part of the time and everything looked just tight as a drum. We saw no loose pieces of the shroud anywhere. Nothing out of the ordinary and after SEP - I mean after injection and the booster came into view - came into my window pretty much of a head on view and we were out a little ways but there was no visible damage at all to the shroud at any time. And Like I said, I think we got a real good look at it the time we spent around it.

CAPCOM Roger. We copy.

SC Okay. Going onto - going on to number 5. We made good communications throughout the entire - -

END OF TAPE

SC Going on to number 5. We've had very good communication throughout the entire powered flight and launch. We've been able to hear the ground on all the calls, and we had no com problems at all.

CAPCOM Rog.

SC How about you Jim. Have you had any com problems from us? How about you. Did you have any com problems from us?

CAPCOM Negative, we experienced no com problems.

SC Okay, question number 6, was there visible venting, Stu, do you want to take over now?

SC Okay, we didn't see anything unusual other than those that you called and when you called the venting while we were station keeping, well of course it came on, rather a beautiful sight, and the only other thing was when you gave a mark for the aps evasive burn I noticed the booster venting and it appeared to be the same area as it had been venting during the station-keeping phase, and the answer came back that that was expected and so forth, and that was the only thing out of the ordinary, other than that everything was fine on all the other vents you called.

CAPCOM Okay, on the number 7. I guess that one may still be open.

SC Yea, I was just trying to whip off a fast answer for you on that one but we don't have any so I guess that Al will tell you the last time that we saw it.

SC Well I guess the last time we sighted the S4B was with the eyeball.

SC Think that's when it was, it was during the propulsion venting, it was kind of a tough angle for us to see because of, it was just a very little over the edge of window number 1. However, depending on the sun angle that was good, it was stable when it was venting, as near as I could tell, approximately, a couple of miles away. We took a few pictures of it with the Hasselblad so we may be able to see the beautiful conical shaped pattern coming from the venting, but as far as control was concerned, it was going in right direction and appeared to be stable.

CAPCOM Roger, we copy.

SC Okay, number 8, Stu, you want to take that one.

SC Okay, I guess the guidance obviously was good and the velocity was real fine. It looked like, during the, during the boost phase, they were running a maybe 2, 2 and a half miles, maybe 3 miles low along my profile looked rather consistant, but we obviously arrived at the right place so the, and the velocity cut offs were right on the money and the TLI guidance I think was within

SC 10 feet 17 or something like that. You've got the numbers, but it looked real good, and the only thing I can comment there was it looked to me like we were going into earth orbit insertion maybe a couple of three low pretty much on the profile.

CAPCOM Roger.

SC All the way on the profile I should say.

SC Okay, are you ready for number 9?

CAPCOM Roger, go ahead with number 9.

SC Okay, the ordeal ball at ignition was as advertised at 8 and a half degres. After ignition went to the normal pitch down and the ball settled out very close to zero, and then the burn progressed eased on up to about a plus 1 degree, then slowly on back to zero then close to the pitch down just prior to the cut off, and I would say somewhere around 2 or 3 degrees negative 357 and 358 on the ball. Prior to cut off.

CAPCOM Okay, and we've got one more write in, question number 10, and it's based on -

SC Okay, I'll take that one Bruce.

CAPCOM Okay.

SC Okay, Bruce, that came from my comment, and as we were station keeping and watching the venting it looked to me like the booster had picked up a little right yaw as I looked at it. I meant moving left on me, but then I just mentioned, it looked like it was moving over a little but then later on I decided that that was just the scatter of the 2 vehicles dead bands because the IU, the S-IVB deadband all the time was solid as a rock even during the venting, and after all that venting, when I went back to try the other dockings, I expected to have to change my attitude a little bit, and as it turned out the attitude was still right within a degree so that was just a call that appeared to, at that time, but the SIVB vented from both sides and it was steady, and I think I was just picking up the movement of the deadbands of the two vehicles.

CAPCOM Okay, Stu, thank you.

SC Rog.

CAPCOM And while the Huntsville people are closing a loop here we had previously given you a flight plan update concerning your waste water dump at 3 zero hours plus 15 minutes and our update was that you dump to zero percent. We'd like now to modify that to a nominal dump to 25 percent on the waste water, over.

SC Okay, we are now modified, 25 percent it small be.

CAPCOM Roger out.

SC Could you tell me about Al's com? You mentioned some dropouts in EKG prior to launch.

SC Apparently you're still not seeing those, are they in any way associated with these voice dropouts you talked about today?

CAPCOM Stand by please. 14, this is Houston. Our belief is that there's no correlation at the present time between earlier EKG problems and the current degraded com through Al's com carrier. We would like to suggest when you have the chance that Al try using the spare com carrier, and see if that improves communications.

SC Okay we'll shift over.

CAPCOM 14, this is Houston. We have received some inquiries regarding your answer to question number 2. The huntsville operations people would like to get a little more detail on the slight hum or buzz. Was it actually an acoustic or audible noise, or was it felt through the structure of the spacecraft and can you give us approximately the time that it commenced and duration. That is, did it until TLI cutoff?

SC Stand by 1, Houston.

CAPCOM Roger.

SC Okay, Bruce, I think the noise is kind of hard to describe I guess, and maybe make outselves clear but it definitely was not an acoustic buzz. It was a high frequency buzz that we felt through the structure, and I'd say it probably started, now this is an approximation, say 2 minutes into the TLI burn.

CAPCOM Okay, and continued through the balance of the burn.

SC Pretty much so, yes. Just about the same level. I wouldn't say that it increased any significant amount.

CAPCOM I realize this is sort of hard to put your finger on. Is there any way you can qualify the level, or give us some feeling for how much, or how high the level was?

SC No, no I think that's pretty tough Bruce. In fact, you know the burn was going so well and the ride was so smooth that we had time to pick it up. I suspect that it was a low enough level that if you had something else on your mind you wouldn't even have noticed it.

CAPCOM Did it, this just sort of start abruptly or did it build up from the background do you think.

SC Well Ed feels it was a build up and I'm not -

END OF TAPE

SC Well, Ed feels it was a buildup and I'm not sure. So let's vote that it was a buildup then. That seems to be a majority. And it just came on kind of slow and came up and stayed at low level and was there.

CC Okay. And the only other question we got back in is at 8 plus 40, this pogo type thing that you mentioned. Could you give us a little more detail on direction of it and the amplitude and anymore elaborations you have on that would be appreciated.

SC Okay, I guess I called out the time on that one in the cockpit. There was no doubt but what it was a slight POGO and I think it was longitudinal and as far as amplitude, I'm trying to think back to some of those POGO tests I wrote on the shake table, but they were of such high level that I wouldn't try to compare them to this. In fact, it was a POGO. I started to slip out that time cause when I felt it, I looked at the clock and it was not -

CC 14, Houston. We have an antenna changeover here and --

CC 14, Houston. How do you read?

CC 14, Houston. How do you read?

SC Okay. How do you read, Bruce?

CC Loud and clear, Stu. How do you read me?

SC Oh, you're 5 square. The static's died down, and - As I was saying, there was no question, but what it was a low amplitude POGO starting right at 8 plus 40, however, the magnitude was low enough that it would not affect - did not affect any of our voices, and you know a fairly low level will do that so I'd say, you know, it was pretty small. It was not of any concern, but picked it up just because of thinking of POGO I guess.

CC Roger. Thank you.

CC And Stu, did that last all the way until shutdown of the S2 or did it die back out?

SC Bruce, I can't give you a positive answer, none of us can. My impression is it was there all the way, but that data really isn't a very good input.

CC Okay. Thank you. I believe this concludes our discussion on the booster question.

SC Okay.

CC Apollo 14, this is Houston.

SC Go ahead, Houston.

CC Okay. Just a little status on the probe situation. We have no further queries on the docking probe at this time. The conclusions of our ground analysis are that the system is now working nominally. And our current intention is that you can go for the lunar landing, and all subsequent events. If we have any further commentary or further discussion on the subject, why, we'll get back to you later

CC on it. With respect to midcourse correction number 2, we plan for that take place at the nominal time which is about 30 hours 36 minutes GET. And it'll be about 71 feet per second, which is also close to nominal. We're planning a GET update of some 40 minutes tomorrow at the nominal time in the flightplan at about 54 40. Over.

SC Okay. We got that Bruce, and are we going to leave this earth darkside dim light photography in?

CC That's affirmative Stu.

SC Okay.

SC Houston. This is Al. I've changed the DCU heads. How does this sound, any better?

CC Would you give us a short count on that Al?

SC Okay. 1 2 3 4 5 4 3 2 1, over.

CC Roger. That sounds a lot better to me.

SC Okay. We'll take mine and make us a spare.

CC Roger.

CC Al, are you using the light weight COMM carrier now, or the Snoopy hat?

SC We're using the light weight at the moment.

CC Roger. Thank you.

SC Houston. 14.

CC Go ahead, 14.

SC Okay. The Delta v check went fine. And on the null bias check, we had a minus 100 to start minus 99.6 at the end.

CC Minus 100 and minus 99.6. And I have your midcourse correction 2 pad here whenever you're ready to copy.

SC Okay, stand by one.

SC Okay, Bruce, I'm ready to copy.

CC 14, this is Houston with the midcourse correction 2 pad. SPS G&N burn 64213 plus 102 minus 023. TEG 030360701 minus 00259 plus 00044 plus 00664 ROLL 282 PITCH 354298 NOUN 44 N/A DELTA V total 00714010006665252785 390. The balance of the pad is N/A. GDC aline Sirius and Rigel. Roll aline 230170002. No ullage. In the burn attitude, S-band high gain antenna pointing angles, PITCH minus 22, YAW 0, wide beam manual mode. LM weight 33647. Your burn time to the nearest tenth of a second is 10.3 seconds for use in checking ball valve operation. Over.

END OF TAPE

SC Okay. I read back NPC 2 - G&N, 64213, plus 102 minus 023, 030, 360701 minus 00259 plus 00044 plus 00664, 282354298, NA 00714, 010, 00665, 252785, 390, the rest in A Sirius and Rigel 230170, 002 no ullage the high gain antenna in burn attitude pitch minus 22, yaw 0, wide beam and manual, LM weight 33647 at burn time 10 at 10.3.

CAPCOM Roger, Houston. Read back correct.

SC Thank you.

CAPCOM 14, Houston. We've had a correction to the yaw angle for the S-band pointing. That should be plus 8 degrees. Over.

SC Roger. The S-band pointing is pitch minus 22 yaw plus 8.

CAPCOM Roger. Out.

CAPCOM Roger. We have it, 14.

SC Okay and they were torqued at 29 plus 20.

CAPCOM Roger.

PAO This is Apollo Control, at 29 hours, 23 minutes. During the last 2 hours or so of this shift, shortly after the maroon team of flight controllers came on, we began preparing for the discussions on the probe and also for the scheduled discussions on the booster performance during the power ascent, during the launch phase. During the discussions on the probe, among the comments that were made by the crew, Roosa noted that there appeared to be no capture latches activating until the probe was retracted or as he put it, we got no capture latches until we went to primary at which time the crew activated the nitrogen pneumatic system which retracts the probe. Ed Mitchell summed up the operation on the successful docking as Mitchell described it, he said Stu Roosa, who was at the controls of the spacecraft moved in on the drogue - he said we started to bounce out and at that point Roosa held plus X on the thrusters, moving the spacecraft into the center of the drogue and said the vehicles began moving together as they activated the primary switch which activates the pneumatic system which retracts the drogue and at that point he said Al called out barber pole and grey and then we got hard docking. The top back indicators that Mitchell was referring to indicate initially that the probe is extended and the docking latches - the capture latches are caught. The second indication of barber pole indicates that the capture latches have in fact captured and latched and finally the third indication of grey shows that the main docking latches have engaged and have closed - the hard docking latches. Perhaps the most significant comments during the discussion of the booster were reports from the crew that they noticed a slight hum or buzz as Roosa described it during a translunar injection portion of the S4B burn. Roosa noted that this very low level hum or buzz, which he said could be felt through the

PAO structure began about 2 minutes into the TLI burn. He also noted that it was slight enough that had the crew had their minds on other things they probably would not have noticed it. Flight Director Milton Windler observed on the circuits here in the control center that this is the sort of vibration or hum that has been reported also by previous crews and there appear to be no particular concern over this. Roosa also reported a slight POGO in the second stage operation beginning at 8 minutes, 40 seconds ground elapsed time. He described it as a longitudinal vibration, very light, very slight. The one thing that he used to characterize this vibration was to compare it with similar vibrations the crew members have been subjected to on vibration tables. Roosa noted that with even a relatively light POGO type vibration on a - in a simualted situation, it's difficult to talk. He said that this was light enough that it did not effect their voices in the spacecraft. The CAPCOM also advised the crew that at about 54 hours that we will have the update to the ground elapsed time clocks in mission control and aboard the spacecraft. At this time the GET clock, clock that is currently reading GET here in mission control will be updated. It will be moved ahead so 40 minutes. The clock that is currently designated TB5 will become the actual ground elapsed time. In other words, that clock will display the true ground elapsed time, the total amount of time that has elapsed since lift-off. The clock which is designated GET will retain that designation. The nomenclature will remain the same on that clock as it's displayed here in the control center and the nomenclature on the clock which will be displaying the actual GET will remain TB5. To repeat that again, recognizing that it's probably a bit confusing. The nomenclatures on the clocks will remain the same, however, what they're displaying will be changed. The clock that is designated GET will actually be referred to here in the control center as the PET clock, the phase elapsed time clock, however, the nomenclature on it, as we understand now will not be changed. It will remain fixed as the GET clock and the nomenclature on the TB5 clock will also remain TB5, however, it will be counting actual ground elapsed time, the total time since lift off. The rational for the update to the clocks is roughly as follows: of course, launching 40 minutes late without changing the amount of energy that was put into the trajectory by the translunar injection maneuver with the Saturn third stage, we would have arrived at the moon 40 minutes late. However, the translunar coast phase is in many respects like a big sponge. You can squeeze things out of it or you can put things into it, use it to absorb time differences. In this case the translunar injection the proper Delta-V, the proper velocity was added to put us into lunar orbit at the same sun time or greenwich mean time as the flight plan called for. The sun time on arrival will ?

PAO then will be the same as it was originally planned to be in the flight plan. And mission events will occur in the same sequence after lunar orbit insertion as the flight plan called for. In order to make the flight plan agree with the sun time and the greenwich mean time, it will be updated 40 minutes. The clock will be moved ahead 40 minutes so that the phase elapse time, which is used as a reference to the flight will agree with the flight plan. The alternative to this would be to update the flight plan by 40 minutes making numerous changes to the flight plan in pencil both here on the ground and by the crew. To circumvent this problem the clocks themselves will be changed recognizing that the clocks are in fact, the GET clock is in some senses an arbitrary time reference which allows us to reference time to the flight plan. The crew was advised that this will occur at about 54 hours as planned in the flight plan. At the present time Apollo 14 is traveling at a velocity of 4536 feet per second and the spacecraft is 115,742 nautical miles from earth. The mid-course correction number 2 is scheduled to occur at 30 hours, 36 minutes, 7 seconds ground elapsed time. The velocity change in that maneuver which will be performed with the spacecraft service propulsion system engine, will be 71.4 feet per second. And it will change the spacecraft approach to the moon - the point of closest approach from the current distance of about 2104 nautical miles down to the planned 60 nautical miles perigee or perilune. The burn will be a 10 second maneuver. A 10 second burn with the service propulsion system engine. The spacecraft at the time of the maneuver will be oriented with it's engine bell pointed in the direction of travel, about 66 feet per second of the burn will be in the direction pointing back to earth or in other words it will be radial or radial component and 25 feet per second - there will be a 25 foot per second component which is retrograde or in the easterly direction. The total composite Delta-V, as I said will be 71.4 feet per second. At 29 hours, 34 minutes, this Apollo Control, continuing to stand by.

END OF TAPE

CAPCOM Apollo 14, this is Houston.

SC I understand.

CAPCOM At your convenience, we'd like P00 and ACCEPT and we'll uplink you a new state vector, target load and the PIPA and IRIG BIAS updates. Over.

SC Okay. Go ahead Houston.

CAPCOM Roger. They're on there way. And at the same time, we'd like to give you one minor flight plan update. Due to your later lift off time on page 3-32, the flight plan, darkside dim light photography we have a new value of longitude over two for you.

SC Okay. Go ahead.

CAPCOM Roger. The old value is minus 42500. The new value is minus 47500. Over.

SC Okay. The longitude over two is now minus 47500.

CAPCOM Roger. And I've been asked to remind you that in connection with the midcourse burn number 2, if there is stratification in the oxygen tanks you may get a CRYO low press light as this is reduced. Over.

SC Roger.

CAPCOM 14, Houston. Your computer.

SC Houston, 14, have you completed the uplink?

CAPCOM 14, affirmative. How are you reading us now. We passed up. The computers yours.

SC Okay (garble) and we're terminating. PTC here in about - Should be here in about, two, three minutes.

CAPCOM Roger. Out.

SC Houston, Apollo 14.

CAPCOM Go ahead, Ed.

SC We see a NOUN 81, Delta by (garble) which is correct?

CAPCOM Apollo 14, Houston. We understand the onboard value is correct and that's an R2 that you're concerned about?

SC Yeah. We've never seen NOUN 81 bound off like that.

CAPCOM Okay. We'll have an explanation for you in a second.

SC Okay.

CAPCOM Apollo 14, Houston.

SC Go ahead.

CAPCOM Roger. On your query on NOUN 81 4.3 is the number it was actually uplinked to the spacecraft. There is no problem involved with the spacecraft rounding off numbers or any of that sort. The maneuver that was passed to you on the maneuver pad was generated from one

CAPCOM computer reading a 4.35 which was rounded upwards by the FIDO to 4.4. A separate computer processed the information leading to the automatic uplink and they rounded down to 4.3. Over.

SC Okay. The computers ought to talk to each other.

CAPCOM Roger. Out.

PAO This is Apollo Control at 30 hours 6 minutes Apollo 14 at this time is 117 213 nautical miles from earth. The spacecraft velocity is 4483 feet per second. About 2 hours ago an auspicious event slipped by unnoticed as the spacecraft passed the half way mark in terms of total mileage or in terms of mileage to the moon I guess we should say. At 27 hours, 4 minutes, 42 seconds Apollo 14 was 109 172 nautical miles from earth or half way between earth and the moon. The spacecraft velocity at that point was 4779 feet per second. We'll cross the half way point in time on the trip to the moon at 40 hours 56 minutes. Both the distance and the time half way point are dependent upon a normal midcourse correction 2. Should that MCC-2 maneuver which is scheduled to be performed in a little less than 30 minutes give us different values it will of course change the total distance by some small amount. The Flight Dynamics Officer has also computed a new set of coordinates and a new time for the arrival of the S-IVB at the lunar surface. The impact is schedule to occur at a ground elapsed time of 82 hours 38 minutes 3 seconds and our new set of coordinates are as follows. The latitude of the impact point now appears to be at 9 degrees 32 minutes south. The longitude 26 degrees 20 minutes west. What we're seeing is a gradual shift of the impact point slightly to the west and moving a bit closer to the Apollo 12 seismometer. Again to repeat the information on the scheduled midcourse correction which is occurring at the second midcourse correction opportunity. It will be the first midcourse. The burn is scheduled to occur at 30 hours 36 minutes 7 seconds ground elapsed time. The burn duration will be 10 seconds. It will be performed with the service propulsion system engine giving a total velocity change of 71.4 feet per second. The bulk of that velocity change will be in a radial direction or back towards earth. And the affect of the maneuver will be to bulge the trajectory slightly so that the spacecraft arrives at the moon a little later and - -

END OF TAPE

PAO Spacecraft arrives at the moon a little later and also at the planned altitude of 60 nautical miles. Without the burn the spacecraft would pass by the moon at an altitude of 21 hundred 4 nautical miles, and it would arrive 40 minutes earlier. With the burn, it places the arrival time back 40 minutes to coincide with the ground elapsed time, and the Greenwich mean time. Correction on that, the time of arrival is fixed by the cutout conditions of the trans lunar injection, and the midcourse correction burn, taking into account the fact that we will be arriving at the moon at the planned Greenwich mean time. We'll depress the trajectory so that the fly by the moon, prior to going into lunar orbit is at 60 nautical miles. And we're now 25 minutes 54 seconds away from that midcourse correction maneuver. The maneuver in addition to lowering the distance at which the spacecraft passes by the moon, will also remove the spacecraft from a free return trajectory in at least 1 sense, and that is that, following the burn it will no longer be possible to reenter the earth's atmosphere in the proper entry corridor using only RCS propulsion capabilities. Once this midcourse correction has been performed, in order to enter the entry corridor properly, it will require either the, either subsequent midcourse corrections using the SPS engine, or the descent propulsion system engine on the lunar module. At 30 hours 11 minutes, this is Apollo Control in Houston standing by.

CAPCOM 14, this is Houston.

SC Go ahead Houston.

CAPCOM Roger, Stu. I'm looking at your DSKY display here and I noticed it was a little different from the pad burn attitude. We believe that if you go back and reload noun 48 with the pitch and yaw trimmed values that we sent up on the pad. Switch her for the combination CSM LM and then redo P40, it would get better agreement with the pad values for attitude.

SC Okay.

PAO This is Apollo Control at 30 hours 17 minutes. We now show the spacecraft to be in the proper attitude for the midcourse correction. I would like to go back over one point that perhaps got a bit garbled in the last report, and that is the effects of this maneuver on the trajectory. Without the burn, without the midcourse correction, the spacecraft, as we said would pass about 21 hundred 4 nautical miles from the moon. Also, its time of closest approach would be about 15 minutes later than desired. With the midcourse correction we place the time of approach at the time desired, which is 82 hours 0 minutes 37 seconds. That'll be the time of closest approach with no further maneuvers, and we'll lower the point of closest approach from the 21 hundred 4 nautical miles to 60.3

PAO nautical miles. We're now about 17 minutes 30 seconds away from that midcourse correction maneuver.

CAPCOM 14, this is Houston.

SC Go ahead, Houston.

CAPCOM Alright you can go ahead and terminate charging on battery OFF at this time.

SC Okay.

SC 14 to Houston. We were in position standing by for a go for MCC 2 burn.

CAPCOM Roger, you're go.

SC Roger.

END OF TAPE

PAO This is Apollo Control at 30 hours 35 minutes. Flight Director Milton Windler is just reminded his flight controllers that we're 1 minute away now from our first midcourse correction. That manuever scheduled to occur now in about 45 seconds. The flight controllers here are monitoring their data and we'll be observing the performance of the Service Propulsion System engine and spacecraft systems during the period of this burn. Total burn duration again is planned to be about 10.3 seconds. It'll give us a change in velocity of 71.4 feet per second. Coming up on 10 seconds. And we show ignition. Our guidance and control officer reports all pressures in the engine look normal. We show the burn has been shut down. We'll stand by for an assessment of the manuever.

SC Mighty good burn there. The residuals - there'll be no trim required.

CC Roger. Out.

CC You heard Stu Roosa report a mighty good burn. No necessity to trim out the residuals with the RCS. Our guidance and control officer reports that the burn duration was an even 10 seconds which is almost precisely as planned.

CC 14, for your information, we showed the actual burn time to be 10.0 seconds. Over.

SC Our telemetry data shows that the spacecraft onboard computer -

SC Gregg, the CMS was never like that.

CC Roger.

SC Houston. At the end of the burn we're showing fuel 002, oxidizer 989 and valves 300 decrease.

CC Okay. Understand.

SC And delta V 6.

SC Amps Delta say minus 4.1.

CC Okay delta V say minus 4.1. Fuel 100.2, oxidizer 98.9 and valves are 300 decreases. Is that correct?

SC That's affirmative. And if you didn't get the residuals they were plus .2 minus 0 and minus .1.

CC Roger. We copy.

CC Our telemetry data showed that the onboard clock timed that burn at 10.19 seconds, which is extremely close to what we showed on the ground. Our reading being 10.0 seconds. You heard Stu Roosa comment that the simulator was never like this. A reference to the fact that the onboard guidance system controlled that burn almost precisely as planned. The Flights Dynamic Officer will begin at this point to gather telemetry data on the trajectory to compute a trajectory or it can determine what effect the manuever had on the trajectory. This is a process that

CC normally requires several hours before the data becomes refined and the Flight Dynamics Officer has a good stable prediction on the effect of the manuever. He'll have a preliminary report somewhat before that usually in a matter of 15 to 20 minutes. 14, this is Houston. We've reviewed the chamber pressure and the SPS engine operation from this last midcourse on the strip chart and it looks real fine. We'll have some more words for you later on the reconciliation of the burn times in tenths of seconds. We're curious as to what value you got with your stopwatch. Over.

SC I showed about 10.2, Bruce.

CC Understand. 10.2. Over.

SC That's affirm.

SC Hey Bruce. What do the strip charts show at PC, 2 banks.

CC We're going to have to convert from percentage of thrust to PSI, Stu. We'll be right at you.

SC Oh, no sweat. Don't want to cause you any trouble. I was just curious.

CC They're doing it anyway. Just hadn't gotten it accomplished for this burn yet.

SC Okay. Just wanted to calibrate my gauge.

CC You might check your middle gimbal angle, Stu for the manuevering.

SC Roger. We're high (garble)

CC 14, this is Houston. For your information, when starting the PTC spin up, we'll use quads alpha and delta. Over.

SC Okay. We'll use alpha and delta for spin up.

CC 14, this is Houston. Your average chamber pressure for this last burn was 100 psi even.

SC Okay, the average was 100 even. Thank you.

CC Roger. Out.

END OF TAPE

SC Houston, 14.

CAPCOM Go ahead, 14.

SC Okay, Bruce. I tell you, I'm sure not seeing what I expected to on this dark side of the Earth through the sextant here. The angles that you gave me lined up the objects pretty much over on the edge of the dark side alright, but through the sextant there's still alot of light coming in, and I - that high speed black and white, I don't see why we're not going to wipe it out. I guess I really expected to see pretty much darkness through the sextant here.

CAPCOM Okay. Stand by.

SC Okay. And there's another strange thing on the sextant on this sighting, Bruce, we got a - -

CAPCOM Stand by.

SC Okay.

CAPCOM 14, this is Houston.

SC Go ahead, Houston.

CAPCOM Roger. We've been advised that there was some illuminated area of the earth expected to be visible in the field of view for this dim light photography. What we'd like you to do is to go ahead using the nominal angle, take your three exposures, and then if it's agreeable to you we'll have a new set of shaft and trunnion angles for you and you could squeeze off three more. Over.

SC Okay. No sweat. I'll press ahead and take some photos.

CAPCOM Roger. Press on.

CAPCOM 14, Houston. Your original transmission, did you say that you could see any of the illuminated portion of the earth through the sextant IP's or just that you had some scattered light coming in. Over.

SC I've got quite a bit of scattered light. It's negative on seeing any of the - of the lit portion, I - manually, you know, I'v driven it over to the terminator and the C&C pulls it back to the dark side. We're pointed on the dark side, but there sure is alot of light showing.

CAPCOM Okay. We copy.

CAPCOM 14, Houston. Have you already mounted the camera on the sextant adaptor? - or to the sextant?

SC That's affirmative, Bruce. On the middle of the first frame I have an - it's no sweat to change, I can do anything you want.

CAPCOM No, no. Don't do that, because we'd have to squeeze off more film at that 24 frame per second prior to dismounting it.

SC Okay.

PAO This Apollo Control, at 31 hours, 26 minutes. As you heard, Stu Roosa is preparing to use the Maurer sequence camera, 16 millimeter data acquisition

PAO camera aboard the spacecraft for the dim light photography scheduled in the flight plan at this time. Roosa will have the camera mounted or actually has the camrea mounted at this time to the sextant of the spacecraft. He uses the spacecraft computer to point the optics in the proper direction, which in this case is at the Earth dark side. And he will take three frames, one - -

SC Houston, I've finished the one minute to 20 seconds, 5 second exposures and I'll just hold here until you give me some more angles if that's what you want.

CAPCOM Okay, Stu. What we'ld like you to do is in your longitude over 2 for a P22, just put in minus 42.5, which was the value that was originally in the flight plan before we updated you and run three more exposures and that will wind it up.

SC Okay. We'll enter that long over two like it was originally in the flight plan and repeat.

CAPCOM Roger. Out.

PAO That last comment came from Apollo 14 commander Al Shepard. Roosa took the first two frames - first three frames, one exposure at 60 seconds, one at 20 seconds, and one at 5 seconds. These pictures taken with very high speed black and white film or hope to show some of the phenomena on Earth that are visible only in very dim light such as lightning. And as you heard, Roosa will now re - repoint the optics and take three more frames of the same phenomena at slightly different pointing angles. Hopefully, one of the two angles will give a minimum of reflected light into the optics. That reflected light, of course, tends to wash out the amount of detail that's visible.

SC Okay, Bruce. I completed the pictures. I put the sextant back on and looked at our second one and it's going to be just about the same.

CAPCOM Roger, Stu. That wraps up the requirements for the dim light photography.

SC Roger.

CAPCOM And just to clear up the situation that I created on giving you a quad alpha delta, we are recommending alpha and charlie for the PTC spinoff and your option on the quad that you used for rate damping.

SC Okay. We figured that's what you meant.

END OF TAPE

PAO This is Apollo Control at 31 hours 42 minutes. The Apollo 14 crew has completed the dim light photography scheduled in the flight plan. The next event will be to stabilize the spacecraft and then spin it up at the relatively slow rotational rate of 3 revolutions per hour. This is the passive thermal control mode used to maintain the proper thermal stability, the proper temperatures of the spacecraft exposing all sides of the spacecraft equally to the radiation from the sun. At the present time we show Apollo 14 121 264 nautical miles from earth traveling at a velocity of 4271 feet per second. The preliminary data from that midcourse correction manuever performed at 30 hours 36 minutes 7 seconds, as called for in the flight plan, as with the delta V gained the velocity resulting from the manuever was 71.4 feet per second. And the preliminary tracking data shows that the manuever had the effect of lowering the point of closest approach to the moon from 2104 nautical miles to 67.05. The manuever was targeted to lower the point of closest approach to about 60 nautical miles. And the Flight Dynamics Officer reports that with additional tracking, we expect the data to show that we came very close to that. The burn was almost precisely normal as planned. The burn duration had been targeted for about 10.3 seconds, and on the ground we measured the burn time at 10 seconds. Of course the guidance system on the spacecraft is designed to shut down the engine, based on the amount of velocity gained rather then the time of the maneuver rather then the time of burn so that it is perfectly consistant for the guidance system to shut down within a fraction of a second of the pre-computed time based on the amount of energy that is gotten from the engine at any particular maneuver. During the burn and for about 1 hour before, Louise Mitchell, wife of Lunar Module Pilot Edgar Mitchell, was in the control center viewing the procedures. We don't have a great deal of activity scheduled on the flight plan now. The Astronauts are scheduled to get another sleep period at 41 hours or about 9 hours 15 minutes from now. During that interim period of time primary activities will be systems monitoring and such things as charging batteries, venting the batteries, and of course setting up the passive thermal control mode which will be beginning soon. Earlier this evening, we again talked with the crew about the condition and the events preceding and leading up to the docking operation and the condition of the probe assembly. Following the crews answering some additional questions about the probe assembly, They were advised that the probe appears to be normal and that we will continue with the normal flight plan leading up to a landing on the moon, as things stand right now.

PAO The Saturn third stage, the S-IVB, based on our last computations will impact the moon at 82 hours 38 minutes and 3 seconds, at a latitude of 9 degrees 32 minutes south, longitude 26 degrees 20 minutes west and as we continue to gather more tracking data, these numbers have been changing and we expect that they will continue to change somewhat. At 31 minutes 47 seconds, this is - rather 31 hours 47 minutes, this is Apollo Control Houston standing by.

CC Apollo 14, this is Houston. Over.

SC All right.

CC 14, Houston. You can secure the high gain antenna at this time. We recommend a PITCH of minus 5 -

SC Go ahead, Bruce.

CC We recommend a PITCH of minus 52 degrees, YAW of 270 for securing the high gain antenna. Request OMNI BRAVO for PTC. Over.

SC Houston, this is Apollo 14. We're reading you loud and clear go ahead.

END OF TAPE

SC This is Apollo 14, we're reading you loud and clear, go ahead.

CAPCOM Apollo 14, this is Houston. You may secure the high gain antenna now, pitch minus 52, yaw 270, request omni bravo for PTC, over.

SC Houston, 14, that's what you have.

CAPCOM Roger.

SC (garble)

CAPCOM Apollo 14, this is Houston. Standby for an important announcement.

SC Roger, stand by.

CAPCOM Roger, you're go for PTC spinup now.

SC What would we do without you, Bruce? Hey, Bruce, why haven't we heard any news, like who won at Daytona and things like that?

CAPCOM Well we tried for one news summary and most of the news came out to be about Apollo 14. We figured you guys were probably the ones that had the inside scoop on that, so we'll give a stab at another one.

SC Yeah, tell us what's going on at the races at Daytona.

CAPCOM Okay, give us a couple of minutes and we'll have some word for you.

SC Oh no, Fred, just at your convience.

CAPCOM Apollo 14, this is Houston.

SC Go ahead, Houston.

CAPCOM If the work load isn't too heavy up there for you, we have another set of noun 88 values for sighting on the S4B, if you're interested.

SC Okay, stand by and I'll copy it down. Okay, Houston, go ahead.

CAPCOM Roger, 14. Noun 88 minus 34293, minus 85901, minus 38013, over.

SC Okay, Bruce, you back with us?

CAPCOM Yeah, I'm still with you.

CAPCOM 14, Houston, how do you read?

SC Hello Houston, how do you read, 14.

CAPCOM 14, we're approaching an antenna switch over period here. Let me give you a call again in a minute.

SC Hello Houston, how do you read, 14?

CAPCOM 14, Houston, loud and clear, how me?

SC We're back with you. How about giving me R3 again, please?

CAPCOM Okay, R3 is minus 38013. Read back over.

SC Okay, read you back from noun 88. Minus 34293, minus 85901, minus 38013.

CAPCOM Roger, read back correct. These are

CAPCOM calculated for a GET of 32 hours 45 minutes. That should be valid from the present up to about 33 45. You will be able to see the S4B when your spacecraft roll angle is between 85 degrees, that's 085 degrees and 020 degrees. If you do see it through the sextant, we'd like you to take some pictures using the same technique as on the dim light photography per camera advance, same film magazine same exposure time, if you concur, over.

SC Okay, sounds great. I understand this is setup for time of 32 plus 4500, however it ought to be good now and we ought to be able to hack it when our roll is between 085 to 020. And if we lamp the big moose, we'll take some pictures of it using the same magazine and the same procedures as the first dim light that we just finished.

CAPCOM Roger, roger.

END OF TAPE

CC Hello, 14, this is Houston. We advise that the S-IVB is tumbling at a rate of 1 tumble, that is 1 360 degree tumble about every 4-1/2 minutes so that the intensity of the object may very if you see it out there. And even if you don't, we've been considering the speed of the film. We'd like to take some pictures perhaps that would show up on photography that you can't see with the naked eye. And another item, your phase plane plot for PTC, looks like you've established a very good PTC here it's curving back around toward the center. We think it's going to hold for quite some time and we'd like to get battery ALPHA on charge at your convenience. Over.

SC Okay, Bruce, copy that. When we get around to the right ROLL angle we'll give a go on the SIVB. Copy about the PTC and we'll start a charge.

CC Roger.

CC Do you see anything out there, Stu?

SC Well, we're just now coming out from behind the LM. Looks like I've got something here in the sextant. Let me pull it out to the center and see what it looks like. Well, Bruce, we've got two things in the sextant and - you know, it could either be a faint star - I don't see any - any tumbling on them yet, but four and a half minutes isn't that fast either.

CC Roger. We copy.

SC Okay, I've lost one of them due to the light coming into the sextant. And I'm about to lose the other object whatever it was.

CC 14, Houston. We got a little sports news for you.

SC Okay, go ahead. You're just in time for dinner.

CC Would you rather I croon something soothing to you, like background music or Raphael's Balareo or something?

SC Negative on the music. We got all that we need here. You can just croon some good sports news.

SC Why don't you hold on a minute and let Ed get his headset on.

SC It's not that detailed.

SC Okay, Houston, everybody's on the line.

CC Okay, I don't know if it was really all that earth shaking, I got the results of the Daytona races. It was won by Pedro Rodriguez from Mexico with his partner Jackie Oliver in a Porsche and they completed 688 laps of the 3.81 mile course there at Daytona in 24 hours. Ronnie Bucknam and Tony Adanelich were second in a Ferrari

CC And Lamar Donahue-David Hobbs team was third. In winning the event, Rodriguez and Oliver averaged over 109 miles per hour for the 24 hour period. And Sunday's Andy Williams' San Diego Open Golf Tournament, Californian George Archer took the honors with a 7 under par score against his closest competitors, Dave Eickelberger and Jack Nicholas. Archer ended up with a 65 and $30 000 in prize money. Over.

SC Okay, very good. Thank you. Keep up the good news.

CC Roger. You can tell Ed to take his headset back off now.

END OF TAPE

PAO This is Apollo Control at 33 hours 10 minutes. We're at a relatively quite period in the flight plan. The crew is scheduled to begin a rest at about 41 hours ground elapsed time. At the present time we show Apollo 14 124 800 nautical miles from Earth traveling at a velocity of 4149 feet per second. The Flight Dynamics Officer reported to the Flight Director a short while ago that tracking seems to be confirming that the midcourse correction maneuver is bringing the spacecraft in a little bit higher above the Moon than had been planned. This would indicate a slight under burn. The predicted point of closest approach at this time is still holding quite close to 37 rather 67 nautical miles. The burn had been targeted to bring the spacecraft to within 60 nautical miles at its closest approach. This particular burn seems to be - seems to have been quite sensitive to very small velocity errors on the order of about 2/10 foot per second would the FIDO set the count for the difference in the planned altitude and the actual at 7 nautical miles. Additional tracking, of course, will probably show some change in that number, but it seems to be holding in quite steadily at about 67 nautical miles. The people in the spacecraft engineering support room report that all systems appear to be functioning well at this time aboard the spacecraft. Virtually no problem of any significance, and, as we mentioned earlier, the crew was advised this evening that with the probe at ... with what we know about the probe at this time, it appears that the mission will be GO for a lunar landing. At 33 hours 12 minutes, this is Apollo Control standing by.

PAO This is Apollo Control at 33 hours 31 minutes. We've had no conversation with the crew since our last report about 30 minutes ago. At the present time Apollo 14 is 125 649 nautical miles from Earth, and the spacecraft velocity is 4121 feet per second. We're preparing for a shift handle over in Mission Control at the present time. And, we do anticipate having a change of shift briefing in the MSC News Center. Probably in about 45 minutes to an hour. Flight Director Jerry Griffin is coming on to releive Flight Director Milton Windler, and the Capsule communicator on the upcoming shift will be Astronaut Fred Hayes. At 33 hours 32 minutes this is Apollo Control, Houston.

CC 14, Houston.

SC Go ahead, Houston.

CC Roger. We took up a collection here in the control room and bought a newspaper and we got a couple more items if you are interested.

SC Great. Take up another collection and you might buy two.

CC Oh, we'll buy you a morning paper, too, a little later. On the Datona race a few more details. Reading

CC into the article Rodrequez and Oliver divided the driving chores up about equally.

END OF TAPE

SC Pick up another collection, you might find 2.

CAPCOM Oh, we'll buy you a morning paper too a little later. On the Daytona race a few more details. Reading into the article, Rodriguez and Oliver divided the driving chores up - -

SC Houston, wait a second.

SC Hold it a second.

CAPCOM Roger.

SC Okay, Bruce. Having a little trouble reading that. Proceed.

CAPCOM Okay. Stand by.

CAPCOM Apollo 14, Houston.

SC Go ahead.

CAPCOM Roger. Back in the Daytona, it says that Rodriguez and Oliver divided - -

CAPCOM 14, Houston. How do you read now?

CAPCOM Apollo 14, Houston. How do you read now?

SC Loud and clear, Bruce. Go ahead.

CAPCOM Okay. Let me try it once more with vigor. Back in the Daytona race, Rodriguez and Oliver divided up the driving chores about equally and had built up a lead of 213 miles at one point in the race. But trouble struck with about 3 hours left when the car's transmission failed as Oliver was motoring around with not a care in the world. Two Ferraris, one driven alternately by Buckman and Tony Adonalis of Wilton, Connecticutt, and another under command of two time U.S. road racing champion Mark Donahue and David Gouds of England, had survived the long night but were out of it as long as the Porsche held together. Oliver brought the powder blue car into the pit and he and Rodriguez spent an agonizing 93 minutes watching their lead wiped out as crewman feverishly made repairs. Bucknam gained a lead 70 minutes from the end and Donahue pulled in the striking distance before crew chief John Wire could get the Porsche rolling again. Rodriguez pulled it back to the coarse a half mile behind Bucknam, who's Ferrari was spitting fire and having trouble getting through the turns. The Mexican hotshot needed less than 2 laps around the 3.81 mile layout to catch Bucknam and was never in serious trouble again.

SC Damn. That's a good summary, Bruce.

CAPCOM Yes. I ought to be a sports writer.

CAPCOM Yes. That was very interesting. Bruce. And the next item here is a headline that says Apollo number 4900 to orbit the Earth.

SC (Laughter)

CAPCOM The aerospace defense command has entered Apollo 14 as number 4900 in it's records of Earth

CAPCOM orbiting satellites. The ADC housed inside Cheyenne mountain is providing NASA with information satellites passing near Apollo 14 during it's journey to the moon. Just thought you might be interested in that.

CAPCOM Well, they always say better late than - -

SC (garbled) It's friendly.

CAPCOM It's better to be number 4900 than not to be at all. And meanwhile today at New York the doors of baseball's Hall of Fame swung open for 7 old timers elected by a veterans committee after the regular ballot of the Baseball Writer's Associations of America has failed to name any modern's to the shrine. Legendary pitcher Rube Marquard who shares the record of 19 consecutive victories in a single season and George M. Wise, the executive geneius who built the New York Yankees into an awsome powerhouse from the late 1940's led the advance of the old timers. Also named were outfielders Harry Hooper, Joe Kelly, and Chuck Heavy, first baseman Jake Beckley and shortstop Dave Bancroft. Marquard who won 201 games pitching mostly for the New York Giants or Brooklyn Dodgers from 1908 to 1925. Hooper who hit 281 in 16 American League seasons, and Kelly and Beckley both pre-1900 stars, were named as real old timers who's careers ended by 1925.

CAPCOM And here's another startling bit of news from London. The headline says "Subway riders arrive. Can't get out of station". More than a dozen passengers were trapped in a London subway station for more than an hour early today when the staff locked up and went home. That sound familiar? When the passengers got off the last train on the Bakerloo line, at the ida avail station in Pattington, they found exits blocked by steel shutters and the station deserted. Police were called and they in turn contacted London subway officials. A spokesman for the London transport said it would investigate the incident. London Subway Service shuts down from about midnight till 5 AM.

SC Could happen to anyone, anyplace.

CAPCOM Also in the news is this other item from London. That D-day is less than 2 weeks away. They're referring here to the day when England changes to decimalized currency. A government agency coordinating the switch said everything is going smoothly. Our latest survey is shown that since November there has been an incredible improvement in the extent to which people are familiar with decimal equivalents. The decimal currency board spokesman said Sunday. On February 15 the new pound, worth $2.40 officially will become worth 100 new pence.

CAPCOM And next on the agenda here. Vehicles are called the top noisemaker. Dateline is from Paris. Motor vehicles are the chief source of city noise and only governments

CAPCOM can do anything about it. This opinion is the result of a 2 year study by the consultant group on transportation research of the organization for economic cooperation and development. Incredible. This problem is world wide.

SC Seems like you do have a good hand on world events and the problem the world's in.

CAPCOM From Laurenco Marques, Mozanbique, this item. Fresh flood waters have poured into Portuguese East Africa cyclone stricken lowlands today hampering rescue efforts for thousands of flood victims already marooned 4 days. The central government said 135 000 persons lived in the worst affected area around (garbled) administrative capital of the central Zambezia Province. Only 24 000 people have been rescued but Zambia governor Lt. Col. David Ferrara declined to estimate the death toll. Good night, Fred.

CAPCOM Very good. Good night, Bruce.

SC Tremendous.

SC Very nicely done. Very nicely done.

CAPCOM We had to censor the best parts.

SC Say again.

CAPCOM We had to censor the best parts.

SC That's too bad. There will be a daily showing, I assume.

CAPCOM We'll see what we can do.

END OF TAPE

SC Houston, 14.

CAPCOM Go ahead, 14.

SC Hey, Bruce. I'm going to take some pictures of this S4B area this time around. Do you want me to have the 2 stripes at 24 frames per second for 2 seconds and everything just like on the other sequence?

CAPCOM That's affirmative, Stu.

SC Okay.

CAPCOM 14, Houston. If you feel like doing a little paper work here, I've got an update to the inflight erasable load procedure as a result of the new (garble) and gyro compensation uplink to you just prior to midcourse 2.

SC Okay, stand by one, Bruce. Okay, Bruce, go ahead.

CAPCOM 14, Houston. Page 9-4 in the GNC check list, load A for Albuquerque. Under identification number 03, the old value is 77143, new value 76674. OID 05 old 00110 new 00320, OID 07 old value 76745 new value 77417, OID 11 old value 00477 new value 006 - make that 00063. Read back, over.

SC Okay, under column A 03 76674, 05 00320, 07 77417 and 11 00063.

CAPCOM Roger, read back correct. For cyrogenic Hydrogen management, we'd like to turn the heater in Hydrogen tank number 2 off and our calculations show that your pairacynthian altitude is currently 67 miles. As the period of our tracking improves we expect this to work down towards about 60 nautical miles. And we have a question for you, have you noticed any cosmic ray flashes during your last sleep period or at other times when the command module was darkened, over?

SC One at a time, Houston. You say Hydrogen 2 heater off? Over.

CAPCOM Roger, H2 tank number 2 heater off, we'll call you when we want it back to auto or on.

SC Okay, it's off now. Yea, verily saw a few flashes, I'm not sure what they're ascribed to, but never the less we saw flashes during the sleep period last night.

CAPCOM Okay, was this -

SC Unfortunately, we we're a little bit - we were a little bit too tired to conduct any sort of measured experimenter data with them, but maybe we can get around to that in the next few days.

CAPCOM Roger, one question, would you say that you were dark adapted when you saw these or did you see them before you were dark adapted?

SC I will speak for myself, I didn't

SC START SEEING THEM UNTIL AFTER I woke up three or four hours after going to sleep.

SC Hey, Bruce, I had a comment, I noticed on that last night I'd wake up several times and I would turn on the light to take a look around PTC and that O2 flow that's been troubling us, and then I'd close my eyes again and I'd see some flashes real soon after I had been looking at these lights. Now they were rather subdued lights, but I certainly wasn't totally dark adapted.

CAPCOM Okay, what sort of lights were you using, the flood lights or the intergals?

SC Using the intergals mostly, on several occasions I did have the floods up to check and then I'd turn them back off again. And it didn't seem to matter much.

CAPCOM Okay, thank you 14.

end of tape

CC 14, Houston. For your information, the program aline was a 404 turning angle better than 90 degrees.

PAO This is Apollo Control at 34 hours 23 minutes ground elapsed time. Gold team flight director Jerry Griffin is being briefed by each of the console positions here, each man runs down the items that he has upcoming for this shift. The off going flight director Milton Wendler accompanied by his flight dynamics officer Bill Moon, are en route to the Houston News Center where they will have a change of shift briefing for newsmen in the small auditorium. Apollo 14 very little conversation from the crew in the last several hours is now showing distance from earth 127 737 nautical miles, velocity 4 051 feet per second. At 34 hours 24 minutes ground elapsed time, this is Apollo Control.

CC 14, Houston.

SC Go ahead, Fred.

CC I wonder if you can varify for us that you have H2 tank number 1 to AUTO and H2 tank 2 to OFF.

SC That's varified.

CC Okay.

END OF TAPE

PAO This is Apollo Control at 34 hours 36 minutes ground elapsed time. We're anticipating no immediate conversation with the rather quite crew of Apollo 14. During the period that the change of shift press conference is under way at the News Center in Houston. The conversations if any will be recorded on tape for subsequent playback. At 34 hours 36 minutes ground elapsed time this is Apollo Control.

END OF TAPE

PAO This is Apollo Control at 35 hours 5 minutes ground elapsed time. During the change of shift press conference some 3 and 1/2 minutes of air-to-ground conversation was recorded on tape for playback at this time. Presently Apollo 14 is 129 338 nautical miles out from Earth, traveling at a velocity of just about an even 4000 feet per second. Some of the major milestones at least from statisticians point of view half way point in time between liftoff and lunar orbit insertion will come at 40 hours 56 minutes. At which time the spacecraft will be 142 119 miles from Earth, and 81 723 miles from the Moon. The anticipated time for crossing the so called equal-gravisphere between Earth and Moon will be 66 hours and 3 minutes and 7 seconds. I believe that tape may be ready now for playback. Let's roll at 3-1/2 minutes and resume live (garbled) air-to-ground.

SC Okay, Fred. We just went through the Hycon and everything checked out real fine and we ended up with magazine W on it.

CC Okay. Copied. And, you ended up with magazine W.

SC Right. That's (garbled) plan.

SC Fredo, do they want these times at this point.

CC That's affirm, Ed. They'd like the times and they'd like how many frames you used on the other mag that was on there.

SC Okay. V as in victor, the vector, recharged with frame 0 and ended with frame 9 before resetting the counter. The LTC clock is on the 764 and 0730 corresponds to GET of 342642.

CC Okay. Copy.

SC Houston, we could play a lot of tic-tac-toe in the next 2 or 3 pages of the flight plan.

CC Say again, Ed.

SC The next 3 pages of the flight plan are very bare. We could play tic-tac-toe all afternoon on those.

CC All afternoon, huh. It's about 02:00 here.

SC ... we just had lunch a few minutes ago, it's afternoon.

CC Okay.

CC Yes, I have to agree with you about the next few pages. They do look pretty slim.

CC 14, Houston.

SC Go ahead.

CC The photo people would like ...

SC ... Fredo.

CC Yes, the photo people would like to know if you got the S-IVB pictures using the dim light Earth side settings there, and about when you did that.

CC If you remember.

SC Stand by. We took some pictures. Whether we got them or not leaves to be seen.

CC Is that a pun.

SC Roger. (garbled)

SC Those pictures were completed at 34 03 25 and they were on magazine J for Juliet.

CC Okay. You got them at 34 03 25 on mag Juliet.

CC 14, Houston.

CC Apollo 14, Houston.

PAO This is Apollo Control. That completes playback of the accumulated tape. We are now alive with Apollo 14, continue to monitor the air to ground loop.

CC Apollo 14, Houston.

SC Go ahead, Houston.

CC Okay. I have a LOI minus 5 hours flyby maneuver pad for you that we owe you about this time.

SC Roger. LOI minus 5 flyby.

CC You got the good book out ready to copy.

SC That's affirmative, let her rip.

CC Okay. SPS slash G&N 63526 plus 090 minus 033 076 59 3154 plus 03823 minus 01043 minus 00084 246 208 062 N/A plus 00212 03964 056 03912 22 2117 087

SC Hold it, Fredo.

CC Okay.

SC Start back with Delta-VT.

CC Okay. Delta-VT 03964 and 056 03912 22 2117 087. The next three lines unchanged

END OF TAPE

SC 2117, 087. The next three lines are NIA then down noun 81 and noun 61 are minus 2786 minus 16802, 11498, 36159. And the last item GEPO5G at 1651225. Under comments, GDC align (garble) are alined 230 P aligned 170, yaw aligned 002, no ulage. And the burn is SPS docked based on the PTC (garble).

SC Okay, I think I missed two under (garble)

CAPCOM Okay, the noun 44 at apogee was N/A perigee plus 00212.

SC Roger, noun 47.

CAPCOM Okay, weight 63526.

SC Okay, (garble) 63526 plus 090 minus 033 at 06759 3154 plus 03 23 minus 01043 minus 00084 246208262. HA is ne plus 00212 03964 056 03912 22 2117 087 (garble) na noun 61 minus 2786 minus 16802 11498 36159 1651225 sirius rigal 230 170 002 no ullage. It has a SPS dock burn PTC (garble)

CAPCOM Okay, Ed, everything's okay, except two items. Apparently one of us got our flip flops wrong here. For the atitude block yaw should be 062 and the noun 33 hours should be 076.

SC Roger, the hours are 076 on 33 and yaw is 062.

CAPCOM Okay, good readback.

END OF TAPE

Dead air.

END OF TAPE

CC 14, Houston.

SC Houston, 14, go ahead.

CC I just wanted to see if you all were still around there. You all been looking out the window lately back in this direction? Seen anything interesting?

SC No, I haven't looked out for a while. Got something interesting for us to look at?

CC I was asking you, if you had seen anything from that vantage point. Pretty dark down here where I am right now.

SC It's been an hour or so, Fred, since I took a look at either back in your direction or at the moon. Let me see if I can see where you are now.

CC I guess the nation on the terminator ought to be somewhere around India, Pakistan, somewhere in that - along that line.

SC Okay.

SC Houston, 14. We have the moon out the hatch window right now, Fred-o.

CC Okay.

SC And I presume that Antilles is possibly out the port telescope at this moment.

CC I guess you'll have to wait about another 20 minutes or so for it to come up in the hatch.

SC Rog. Yeh, it's slipped off of it's down just a little bit too far for us to see.

CC Let's see, how big a moon are you seeing there, is it about not quite a half or something?

SC Rog. Short of a half and for size it appears about like an orange held just short of arms length. (garble) about a degree and a half to the left.

SC Roger. The board here has you about 135 000 out now.

SC Okay, that'll make it slightly over a degree then I guess. As you already know Fred, the moon starts to take on a little bit of brown and grayish colors about this point as opposed to being so very bright as it appears from the earth. You can start to see a little bit of texture here.

CC Yeh, that's a good word to remember that texture business.

SC Yeh. And Fred, I have the binoculars going out window 5 and things are starting to look very interesting from this point of view.

CC They ought to look a little better as you - static

SC Houston, 14.

CC Go ahead 14.

CC I have the home planet out the hatch window now and where did you say the terminator is?

SC Oh my estimation is somewhere between the Sudan and India.

SC Rog.

CC And looking at your position, overhead here, you ought to have the Phillipines, mainland, the far East in sight.

END OF TAPE

SC As a matter of fact, I do Fred, there is quite a bit of cloud cover and I'm having a little bit of difficulty identifying land masses. I be able to pick it up the next time around, Ed.

CAPCOM Okay. And 14, Houston.

SC Go ahead.

CAPCOM Yeah, I was trying to give you a sunrise terminator, Ed. I guess from your - I'll get some pictures here that tell me that what you're probably looking at is the sun set terminator and that's running right through Australia and right across the coast of China.

SC Okay, that makes more sense of it, I am pretty sure I had the Australian continent down at the bottom of my lighted area and looking up across the Philipines, there is a great deal of cloud cover in that area, but there are a few islands standing out. I believe that I can see the southern tip of India standing out without too much cloud on it.

CAPCOM Rog, India should be right about at the edge.

SC Right. Houston, 14.

CAPCOM Go ahead, 14.

SC Is there still a semi-sizeable tropical storm off the east coast of Australia?

CAPCOM Hey, I'll ask somebody about that one, Ed.

SC Part of it seems to be in darkness now, but I seem to be seeing about half of a very large circulating air mass.

CAPCOM Roger, Ed.

SC (garble)

CAPCOM Okay, stand by, Ed, we're getting kind of a bad time right now.

SC Houston, Apollo 14, are you there?

CAPCOM Okay, I think we may be back on good omni now, Ed, go ahead.

SC Okay, I don't have (garble)

CAPCOM Say that last again, Ed.

SC I say, I don't have very much viewing time on either the moon or the earth. As it swings past the window it's very low and we just have a few minutes on each window. But it's a most inviting and magnificent view, I'm very glad we have Earth as a home planet. I hope we can keep it so it is inviting.

CAPCOM Roger, Ed, yeah again looking up at the big board I can - you can get another 20 000 miles or so, then you'll be more directly in the Earth Moon plane and you ought to have them pretty much centered in the window about then.

SC Okay, thank you.

SC Houston, Apollo 14.

CAPCOM Go ahead, Ed.

SC Right, Fred, I'm watching thru the right hand rendezvous window at the thermal skin on the LM. Right now and it is in full sun outside my window and I observed the sun came directly onto it (static) heat and then cools off it pops back into shape again as it begins to cool off on the next cycle. It gives a rippling effect as the sun passes across it. It's very interesting.

CAPCOM Apollo 14, Houston.

SC Go ahead.

CAPCOM Okay, I heard a little bit of your onset there, Ed, before Omni B got us again with the bad calm there. And I guess LM 8 got built just like LM 7 because I noticed that same sort of thing there.

SC Yeah, I guess that's what it is all about.

END OF TAPE

SC Yes, I guess that's what it's all about. Thermal protection expands the beam and then contracts. It's sure doing it on the cycle.

CC With respect to your weather question a while ago, Ed, they say they do have a weak cyclonic storm to the west of Austrialia, but they aren't showing anything to the east and I ambe misunderstood, I thought you said you saw it over by the sunset terminator to the east.

SC Roger. It appeared to be by the sunset terminator a very, like a donut shaped cloud several thousand miles across. It might have been too large for just the tropical storm they're talking about. Couldn't be very wide spread circulation.

CC Yes, I guess they need to go look out the window down there, too.

SC Okay.

END OF TAPE

PAO This is Apollo Control 37 hours 7 minutes ground elapsed time. Very sparse conversation coming from the crew of Apollo 14. This crew won't be noted for being verbose. I have some gee whiz numbers on the mission. Present distance from earth 133 930 nautical miles, velocity 3 851 feet per second. At 37 hours 7 minutes ground elapsed time, continuing to monitor air to ground as long as the crew is awake, this is Apollo Control.

END OF TAPE

CAPCOM Apollo 14, Houston.
SC Go ahead, Houston.
CAPCOM Okay, we're ready to suspend battery charge on A.
SC Okay.
CAPCOM All filled up again.
SC Glad to hear it.

END OF TAPE

Dead Air.

END OF TAPE

APOLLO 14 MISSION COMMENTARY, 2/2/71, 5:04 CST, 38:01 GET, 133/1

Dead air.

END OF TAPE

APOLLO 14 MISSION COMMENTARY, 2/2/71, 5:26 CST, 38:23 GET, 134/1

Dead air.

END OF TAPE

SC Houston, 14.
CAPCOM Go ahead, 14.
SC At 39 hours the LM and command module delta P is reading 0.75.
CAPCOM Roger. 0.75.
SC Check.

END OF TAPE

CAPCOM 14, Houston.
SC Go ahead, Houston.
CAPCOM Is Ed around with a headset on?
SC Affirmative.
CAPCOM Okay, Ed. I'm not - -
SC I am listening, Fredo.
CAPCOM Yes. I'm not maybe clear on a question you had earlier about the ball valves with respect to time in the burn on MCC-2 but I do have some data here. And I think crux of it is that if you use a tube of the ball valves visually showing full open to full closed you'd be shifting your - what you're actually starting and stopping you clock by about a quarter of a second from the actual chamber pressure. But the total delta time is very close. On that burn you would have clocked 10.15 versus 10.2 via PC.
SC Okay. You say had we measured PC we would have clocked 10.15. Is that affirm?
CAPCOM No. You would have - from 90 percent PC down to 10 percent, you'd got 10.2 seconds and if you'd started you watch with bank A full open to the bank A needle showing full closed, you'd measured 10.15, except in the time - after the time scale, you'd started and stopped you watch one quarter second to the right. Cause there is a lag in the - what I'm telling you is there - -
SC Okay.
CAPCOM There's a lag in those needles moving by about a quarter of a second from what the actual chamber pressure is.
SC Okay. I understand.

END OF TAPE

DEAD AIR

END OF TAPE

Dead air.

END OF TAPE

APOLLO 14 MISSION COMMENTARY, 2/2/71, 6:39 CST, 39:36 GET 139/1

Dead air.

END OF TAPE

CC 14, Houston.

SC Go ahead, Houston.

CC I know you'll be happy to hear that we won't have a need to do the uplink here at 39 40. The state vector looks in great shape as is.

SC Very good, glad to hear that, you're right.

CC We won't have to work that in to this busy schedule.

SC Okay. We'll procede to the next item.

END OF TAPE

PAO This is Apollo Control 39 hours 59 minutes ground elapsed time. Flight surgeon just reported a few moments ago that apparently lunar module pilot Ed Mitchell had unplugged his biomed harness and apparently was preparing to go to sleep. They're somewhat ahead of schedule on this particular item in that the rest period is not scheduled to begin until 41 hours ground elapsed time, which is almost 2 hours from now. One hour from now, I beg your pardon. I don't see how it could be much quieter when they were asleep or awake, judging from the past several hours sparse conversation. Apollo 14 now 140 147 nautical miles out from earth, velocity 3 657 feet per second. An update for S-IVB impact which was run at 37 hours approximately ground elapsed time shows the impact point at 8 minutes 52 - as you were 8 degrees 52 minutes south 25 minutes - 25 degrees 51 minutes west at a ground elapsed time of 82 hours 37 minutes 33 seconds. At 40 hours 1 minute ground elapsed time, this is Apollo Control.

END OF TAPE

CAPCOM Okay, you're now 93.
SC Okay, 93.
SC (garbled) 1100
CAPCOM Roger, (garbled)1100
CAPCOM 14, Houston.
SC Go ahead Houston.
CAPCOM Okay, the TTC is divergent enough that they're not going to make it through the next upcoming sleep period so we'd like you to stop at about zero roll and we'll re-initialize in the interim you can do any venting or dumping you might have to do and - before cranking it up again.
SC (garbled) with what we have to do and everything, we'll probably catch you when we make the next round.
CAPCOM Okay. Okay, and heaters zero R180 roll will be okay.
SC Okay.
CAPCOM And 14, Houston, who's duty cook tonight? Joe?
SC We don't have one right now.

END OF TAPE

CAPCOM 14, Houston.
SC Right here.
CAPCOM Okay. We'd like an H2 tank number 2 to AUTO.
SC Okay. H2 number 2 going to AUTO now.
CAPCOM Okay, that's a heater switch, Al.
SC Check rights.

END OF TAPE

APOLLO 14 MISSION COMMENTARY 2/2/71 0732 CST 40:29 GET 144/1

DEAD AIR

END OF TAPE

APOLLO 14 MISSION COMMENTARY 2/2/71 GET 40:45, 7:48 CST 145/1

DEAD AIR

END OF TAPE

APOLLO 14 MISSION COMMENTARY, 2-2-71, 7:58, CST 40:58 GET 146/1

DEAD AIR.

END OF TAPE

APOLLO 14 MISSION COMMENTARY 2/2/71 41:07 GET 08:10 CST 147/1

DEAD AIR

END OF TAPE

APOLLO 14 MISSION COMMENTARY,2/2/71,0822 CST,41:19 GET,MC-148/1

PAO This is Apollo Control at 41 hours 25 minutes GET. According to flight surgeon Willard Hawkins and here in Mission Control the only one still apparently awake is Commander Shephard aboard Apollo 14 and he apparently is settling down into the easy rythmic breathing of one going to sleep, but Roosa and Mitchell have apparently been asleep for some time. Apollo 13 - Apollo 14 now 143 114 nautical miles from earth. Travelling at a velocity of 3568 feet per second. At this time we will take down the air-to-ground circuit and should the crew wake up and make a call back to the control center we will tape this for delayed playback. 41 hours 26 minutes GET, this is Apollo Control.

END OF TAPE

PAO This is Apollo Control at 41 hours 33 minutes GET. Apparently not everyone is asleep up there, cause we had a call just a moment ago offering the crew status and on board read outs so we'll play catch up with the tape and go live as quickly as we get through the brief burst of tape. Lets go.

SC Houston, 14. We are ready with our crew status report and with the VERB 74.

CAPCOM 14, Houston. Got a new CAPCOM now. Stand by one before you start that report.

SC Okay.

PAO New CAPCOM referred to is Gordon Fullerton who is replacing Fred Haise at the CAPCOM's console. Some hand over going on here in the room. Pet Frank being briefed by the out going Flight Director Gerry Griffin, who will be coming to the news center as soon as the hand over is complete for briefing on God only knows what, but at any rate he will be coming over that way. We're standing by live on air ground at 41:35.

SC And Houston, 14.

CAPCOM 14, Houston. Go ahead.

SC Okay, Gordon. Fred made his comment before you left, I guess you're wondering if to reesstablish PTC before we sack out. Is that affirm?

CAPCOM Affirmative.

SC Okay.

CAPCOM Apollo 14, Houston.

SC Go ahead Houston.

CAPCOM Roger, we're waiting for a good OMNI to come up before studying that A memory dump. One reminder is to complete all dumping before you try to start the PTC again, and a question. With respect to the 02 flow high columns you had yesterday and any that you might have had since, we were wondering if you are doing anything different than normal procedures as far as the waste management overboard drain or any other out side drains that control 02 flow high problem. Over.

SC That's a negative on the procedures. We're not doing anything unusual there, and we haven't had any problems today. The 02 flow you saw a minute ago as we were pumping up the cabin to 57 and as far as the ones that we had yesterday, we really do have that sacked out.

CAPCOM Roger, Stu. 14 Houston, we are ready for the E mod dump.

SC Okay, Gordon. VERB 74 and coming at you.

CAPCOM Roger. Apollo 14 Houston, we are ready to copy your crew status report and on board read outs, over.

SC Okay. You have (GARBLE) is excellent, we have a negative medical report. AP C is 37.0, (GARBLE), ROP 37.2 RCS of A 87, RCP 89, C86, C88, now we are taking it over

END OF TAPE

SC 41 00 00.

CAPCOM Roger Al would you say BAT C voltage again.

SC 37.0

CAPCOM Roger, we copy all of those. Go ahead.

PAO This is Apollo Control Houston, at 41 hours 53 minutes on to the flight of Apollo 14. Our displays show Apollo 14 presentlly 144 049 nautical miles away from the earth and traveling at a velocity of 3540 feet per second. The change of shift has been effected in the mission control center. The orange team of flight controllers replacing the gold team. There will be a change of shift briefing in the small auditorium of building 1 in approximately 10 minutes. This will be a change of shift briefing with the flight director Gerry Griffin. The modular space station news conference has been moved from the 9:30 time to 1:30 pm this afternoon. I repeat the modular space station news briefing has been moved back to 1:30 pm this afternoon. At 41 hours 54 minutes into the flight of Apollo 14 this is Apollo Control Houston.

END OF TAPE

CAPCOM Apollo 14, Houston, over.

SC Go ahead, Houston.

CAPCOM Roger. We're within rate limits and it looks like a good place to start the roll rates for PTC.

SC Okay, we're going to hang loose for a few minutes here before we spin it up.

CAPCOM Roger, Stu.

CAPCOM Apollo 14, Houston.

SC Go ahead, Houston.

CAPCOM Stu, when you do get ready to spin up let us know before you do and we'll catch it at a good point to start it and give you a GO. Over.

SC Okay, that sounds like a good plan. We want to make sure that we've got all the activity quieted down before we spin up.

CAPCOM Roger.

PAO This is Apollo Control, Houston at 42 hours, 5 minutes now into the flight of Apollo 14. Our displays now show Apollo 14 at a distance of 144,443 nautical miles away from Earth. Velocity now reading 3528.5 feet per second. At this time we will take the line down and switch to the change of shift news conference. At 42 hours, 5 minutes this is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control Houston at 42 hours 32 minutes into the flight of Apollo 14. Apollo 14 now at a distance of 145 367.8 nautical miles and traveling at a speed of 3501 feet per second. Since our last report CAPCOM Gordon Fullerton has had only a brief contact with 14, with command module pilot Stu Roosa. We'll play that for you now.

SC Houston, 14.

CAPCOM Apollo 14, Houston. Go ahead.

SC Okay Gordon, I think we are through with our, all of our venting for the present time. At any time you say we will vent up.

CAPCOM Okay. Stand by, I guess we want to wait here a little bit.

SC Okay.

PAO This is Apollo Control Houston. Surgeon data indicates that the space craft commander Alan Shepard, Stu Roosa and Ed Mitchell are still awake, but apparently getting ready to start their rest period. We're at 42 hours 34 minutes into the flight and this is Apollo Control Houston.

END OF TAPE

CAPCOM Apollo 14, Houston, its looking good now, we're starting the (garbled).

SC Okay Gordon, we'll give it a go.

PAO Apollo Control Houston, 42 hours 43 minutes into the flight, that brief exchange was conversation between Cap Com Gordon Fullerton here in Mission Control and Stu Roosa, the Command Module pilot. We now show Apollo 14 at a distance of 145 757 nautical miles, travelling at an ever increasing speed of velocity now reading 3489 feet per second. We'll standby and continue to monitor here in Mission Control, and this is Apollo Control Houston.

CAPCOM Apollo 14, Houston.

SC 14, go ahead

CAPCOM Roger, I'm sorry to have woken you up, if you'd dozed off, but we'd like you to check the S-band normal mode voice switch on, and go on to sleep then.

SC Okay, standby.

PAO Apollo Control Houston at 42 hours 57 minutes, that was Al Shephard responding to CAPCOM Gordon Fullerton's call. 14 now 146 192 nautical miles away from earth. Present speed reading 3476 feet per second.

END OF TAPE

APOLLO 14 MISSION COMMENTARY, 2-2-71, 1000 CST, 42:57 GET, MC-153

DEAD AIR.

END OF TAPE

APOLLO 14 MISSION COMMENTARY, 2-2-71, 1010 CST, 43:07 GET, MC-154/1

PAO This is Apollo Control, Houston at 43 hours, 32 minutes now into the flight of Apollo 14. We show the spacecraft presently 147,372 nautical miles out into space and traveling at a speed of 3442 feet per second. We've had no contact with the crew of Apollo 14 since our last report. Commander - spacecraft Commander Al Shepard, Stu Roosa, and Ed Mitchell now into their rest period. Our flight surgeon is presently monitoring data on spacecraft Commander Al Shepard. His data indicates that Shepard is relaxing but probably not yet asleep. At this time we will take our live air ground line down and bring it back up should we have contact with Apollo 14. We're at 43 hours 33 minutes into the flight and this is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control Houston, at 44 hours 32 minutes now into the flight. Apollo 14 is presently 149 338 nautical miles out from earth. Its velocity now reading 3384.9 feet per second. We have had no communication with the crew since our last report. The crew of Apollo 14 now well into their rest period, our clock in mission control shows 6 hours and 27 minutes remaining until time of wake up. Meanwhile the surgeon is following data on spacecraft commander Al Shepard. He reports that Shepard entered into a sound sleep at 43 hours 43 minutes GET time. We're at 44 hours 33 minutes into the flight, and this is Apollo Control Houston.

END OF TAPE

PAO This is Apollo Control, Houston, at 45 hours 32 minutes now into the mission. Apollo 14 is now about a distance of 151 272 nautical miles away from the earth. It's now traveling at a speed of 3329 feet per second. We've had no communications with the crew since our last report. The crew is now well into its rest period - into their rest period. One of our countdown clocks in the control center shows a wake-up time of 5 hours 27 minutes from this time. So at 45 hours 33 minutes continuing to monitor, this is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control Houston at 46 hours 22 minutes into the mission. We now show Apollo 14 at 152 854 nautical miles away from earth, and its present velocity 3283 feet per second. Our clock in mission control shows 4 hours 37 minutes remaining on the rest period of the Apollo 14 crew. We would also like to repeat at this time an earlier announcement, the Modular Space Station News Briefing is scheduled to begin in about 5 minutes, at 1:30 pm. That's 5 minutes at 1:30 pm in the news center briefing room. At 46 hours 23 minutes, this is Apollo Control Houston.

END OF TAPE

PAO This is Apollo Control, Houston at 47 hours, 32 minutes now into the flight of Apollo 14. Our displays presently show Apollo 14 at a distance of 155,040 and traveling at a velocity of 3202.6 feet per second. Presently in Mission Control one of our bottom clocks is counting down to the time of the GMI liftoff update. The clock presently reads 6 hours, 57 minutes counting down toward the GET at 54 hours, 30 minutes. One change in the flight plan and that concerns the housekeeping in the lunar module. This will be done in the PTC or passive thermal control mode to conserve RCS propellants. This scheduled for 61 hours, 45 minutes comes after the clock update. However, the ground elapsed time will remain exactly as that shown in the flight time and the Central Standard Time will remain essentially unchanged. It's been a very quiet day over the Flight Director's loop. The individual flight controllers monitoring their systems, talking to their backrooms, really have very little to say of wide-spread interest. We're at 47 hours, 34 minutes into the flight and this is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control, Houston, at 48 hours 22 minutes now into the flight of Apollo 14. We presently show Apollo 14 at a distance of 156,579 nautical miles away from earth, traveling at a speed of 3178 feet per second. Meanwhile in Mission Control over the past 20 to 30 minutes flight director Pete Frank has been discussing with his flight control team procedures for Al Shepard and Ed Mitchell's lunar module housekeeping chore scheduled for early tomorrow morning and flight plan changes are emerging. Since there will be no midcourse correction 3 scheduled, the current outlook is to move the LM housekeeping forward by 1 hour. Moving forward to 61 hours 20 minutes ground elapsed time from the previously scheduled 62 hours 20 minutes. This would also move the television time forward by 1 hour, moving to 60 hours 40 minutes ground elapsed time from the previously scheduled 61 hours 45 minutes ground elapsed time. Honeysuckle will be the station for this transmission. Considered into the change - into the changes - is a revision back to the original flight plan, where by we would not continue with PTCR, the passive thermal control mode. The consideration given here was that a waste water dump will have to be scheduled in any case. The procedure to be followed would be to schedule this dump as close as possible to the television and the housekeeping. The advantage to moving forward by 1 hour is to put the LM housekeeping activities all on one shift. The previous planning or scheduling would have a shift change with about 1 hour remaining in the activity. Also moments ago the flight dynamics officer has passed along a new set of updates for S4B impact. The coordinates now read 8 degrees, 40 minutes south, 26 degrees, 19 minutes west at a ground elapsed time of 82 hours 38 minutes 3 seconds. Uniquely the spacecraft, Apollo 14 will be passing over the front side of the moon at the time of impact. This was not the case in Apollo 12. It should be passing over a longitude of 61 degrees east at time of impact along its flight path. This would place it about 30 minutes away from passing over the longitude of impact. We will shortly be changing shift here in the Mission Control Center with the maroon team coming in to replace the orange team of flight controllers. The orange flight control team took over this morning shortly before the crew entered its rest period and we have not heard from them aside from the first 15 or 20 minutes of our shift. We're at 48 hours 26 minutes into the flight and this is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control, Houston at 48 hours, 39 minutes into the flight. We now show Apollo 14 at an altitude of 157,109 nautical miles, a velocity of 3163 feet per second. We will repeat an earlier announcement, that being, that we do have a flight plan change emerging. Since there will mid-course correction 3, the current plan at mission control is to move the lunar module housekeeping forward one hour. This would move that time forward to 61 hours, 20 minutes ground elapsed time. By the same token this would also move the television transmission time forward one hour, moving to 60 hours, 45 minutes ground elapsed time. The Honeysuckle Station would be the station having acquisition. Further the decision has been made not to continue in the passive thermal control - control mode during the lunar module housekeeping period. This decision being made since there is a requirement to have a waste water dump and the present plan or outlook is to move the waste water dump to a time close to the lunar module housekeeping. There is an advantage to moving forward the housekeeping one hour, this advantage being that all of the activity will take place with one shift of flight controllers. We're in at 48 hours, 41 minutes into the flight and in Mission Control we're in the process of hand over from the orange to the maroon team of flight controllers. Since the Apollo 14 crew, Al Shepard, Stu Roosa, and Ed Mitchell were asleep for the entire shift, there will be no change of shift briefing scheduled. This is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control at 49 hours 32 minutes. At this time in Mission Control the maroon team headed by Flight Director Milton Windler has completed its briefing. Each of the Flight Controllers reviewed the status of the mission and the spacecraft with the Flight Director and we find everything progressing smoothly at this time. No problems with the spacecraft. The Surgeon reports that all the crewmen are healthy. At this time in the sleep period they've all gotten at least 6 good hours of sleep. Sleep period is scheduled to last for another hour and 27 minutes. Some of the telemetry data would indicate that there has been some stirring around in the spacecraft but at the present time all three crewmen would appear to be sleeping or at least resting. Coming up on this shift among the activities is the clock update and this is scheduled to occur in the flight plan at about 54 hours 45 minutes ground elapsed time. Flight Director Milt Windler advises us that that won't be an advent that'll occur at any precise instant but will probably require a total of about ten minutes to synch all the clocks together at the updated time but at about 54 hours 45 minutes we would plan to jump ahead in ground elapsed time to about 55 hours 25 minutes. The exact amount of time to be changed will depend on assessments as to the need for midcourse correction 4 but the variation would be very slight, a matter of seconds. At the present time the Flight Dynamics Officer reports that the midcourse correction 4 if it is needed at all, would appear to be around 2 feet per second. The additional tracking data shows the pericynthion to be coming closer to the preferred 60 nautical miles - we're presently showing it at 65 and when initial tracking came in yesterday following a midcourse correction maneuver, the data showed that the pericynthion was about 67 nautical miles and as expected and as we've seen on previous missions, additional tracking tends to confirm that the pericynthion is in fact lower than the initial tracking shows. At the present time, we show Apollo 14 traveling at a velocity of 3117 feet per second and the spacecraft altitude right now is 158 778 nautical miles. We'll continue to stand by and come up as soon as we hear any conversation from the crew. As I said the sleep period is scheduled to end in about 1 hour and 25 minutes from now. At 49 hours 35 minutes this is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control at 50 hours 32 minutes and at the present time we're awaiting the crew's awakening. The crew is scheduled to awake from this sleep period in 27 hours, or rather 27 minutes, 45 seconds and at the last check with the surgeon we hadn't seen any indication that the crew was stirring at this time. During part of the period of time since our last announcement, we've been on a low bit rate data and have not had heart rates from the crew, which of course is the primary indication as to whether or not they're sleeping or beginning to stir. At this time, Apollo 14 is 160,493 nautical miles from earth, and the spacecraft velocity, 3,069 feet per second. This will be a relatively quiet shift as planned in the flight plan. Coming up we have the clock update which will occur at about 54 hours 45 minutes. They'll be running some checks on the S-band communications equipment and the VHF system in preparation for the bistatic radar test to be performed later in the mission. And they'll be changing lithium hydroxide, on the lithium hydroxide canisters in the command module. There's also a crew exercise period scheduled at about 57 hours, that would be using the in flight exerciser, which is an isometric, isotonic type device. We'll be standing by for the crew to awake and as soon as we get any conversation from the spacecraft we'll come up again and begin covering the air to ground live at that time. At 50 hours 34 minutes this is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control at 50 hours 54 minutes. We just received a call from Al Shepard so we'll pick up and follow any conversations live from this point on.

SC Houston, Apollo 14.

SC Houston, Apollo 14.

CC Apollo 14, this is Houston. Go ahead.

SC Good morning, Burt. We're reading you loud and clear. We have completed our post-sleep check list. We have the rates ready for you when you're ready to copy.

CC Roger. Go ahead with the postsleep checklist.

SC Okay. The checklist is complete (garble). We have the following readings dosimeter. Al 16041, slept 5 hours, Stu 01038, slept 7 hours.

CC Okay, 14. Understand. Al 16041 and 5 hours, Stu 01038 7 hours, Ed 05038 6-1/2 hours. Over.

SC That's correct.

CC Apollo 14. This is Houston.

SC Good morning, Bruce, go ahead.

CC Roger. I don't want to interrupt your eat period, but when you have a convenient time, I have a plan update for you. It's a fairly lengthy one. Nothing in the immediate future though.

SC Okay. Stand by.

SC Roger. Roger, stand by for about 5 minutes or so and be advised we completed the LiHO canister change at 51 hours and the LM command module Delta V at 5059 plus 0.95.

CC Understand 0.95 for the Delta V and 5059.

SC Affirm.

SC Hey Bruce. I'll take that flight plan update. Per Se it.

CC Okay Stu, here we go. You may want to just get out the flight plan and mark out the items as we go along or you can copy it down, either way.

SC No, I'd rather work on the flight plan if you give me the right places to go.

CC Okay. Up through 5920, that's 59 plus 20 everything is nominal, and from there on you take the LM CM DELTA V vent at 59 hours and 25 minutes and move that up to 59 hours even.

SC Okay, we'll move the LM command module DELTA V vent up to 59 even.

CC Roger. Take the P 52 that occurs at 5945 and move it up 10 minutes to commence at 59 35. Over.

SC Okay. We'll shoot a P 52 at 5935.

CC Roger. At 60 hours and 20 minutes you have an 02 fuel cell purge and waste water dump listed. We want to move those up to 59 hours and 50 minutes. That's 59 plus 50.

SC You still with us? Okay, Bruce, I moved the fuel cell purge. Yes I've just (garble) in here Bruce. Moved the fuel cell purge and the waste water dump to 59 50.

CC Roger. Delete midcourse correction number 3. Over.

SC Jolly good. We'll strike out mid-course 3.

CC Okay, now everything scheduled between the times of 60 plus 55 and 64 plus 10 should be scheduled 1 hour earlier. And if you look at 64 plus 10, the break point there comes after the VERB 48 and we're going to have a right in that says establish PTC at 6310 and LOIH canister change comes at the nominal 6412. Over.

SC Okay. Let me go over this one again. Then everything from 61 hours 64 10 is moved up an hour. Is that affirmative?

CC Roger. Starting with the prepared transfer items per LM activation checklist and all that stuff.

SC Okay, we'll move that up 1 hour. Okay. I've got that. Everything from 61 to 6410, move up an hour.

CC Roger. Stand by a second.

CC Roger, Stu. At the time of 6310 following the LM housekeeping activities, restablish PTC. Over.

SC Okay we go to PTC at 632.

CC And perform the lithium hydroxide canister change at the nominal currently scheduled time of 6412 and pick up the normal flight plan timing in sequence afterwards. Over.

SC Okay. We'll change the canister at 6412 on time and then be back on the flight plan.

CC Roger. And I have a 51 hour consumable update for you if you're ready to copy back at 51 hours.

SC Stand by 1.

SC Okay, let her rip, Bruce.

CC Roger. Read me, Stu. I think we're in the process of changing antenna's.

SC I read you loud and clear. I'm ready to copy.

CC Okay. GET of 51 hours even, RCS total 84 percent, ALPHA 84, BRAVO 83, CHARLIE 84, DELTA 84. H2 tank 1 79.3 79.7, 02 tanks 92 91 45, over.

END OF TAPE

SC Houston, Okay, got you at 51 hours total 84, alpha 84, bravo 83, charlie 84, dog 84 h2 79.3, 79.7 02, 92, 91 and 45.

CAPCOM Roger, and you may be interested in knowing that at the present time you are only 20 pounds of RCS fuel below the nominal, so you're really gaining on it there.

SC I'm sorry Bruce you busted up, would you start over again please?

CAPCOM Roger, with respect to total RCS fuel, you are only 20 pounds below the planned RCS budget at the present time, and you are -

SC Okay, that's broken up pretty badly, I can read we are 20 pounds below nominal.

CAPCOM Okay, Stu, how do you read now?

SC Okay, I'm back with you and I copied the 20 pounds.

CAPCOM Roger, and that's really closing in on the nominal there. A couple of other items that came up while you were asleep is that we're going to go ahead and exit PTC for the LM housekeeping, since we want to have the TV up for it, and we'll just go ahead and dump the waste water anyway, or, wait a minute, I'll run that by again. We need to dump the waste water, which will ruin PTC, consequently we're going to come out of PTC for the LM housekeeping and have a good TV attitude to boot. One item is that, I believe you went to sleep with 1620 showing on the DSKY, which was continuously updating during your sleep period, and unless you have strong feelings otherwise, we would rather have a blank display up on the DSKY to keep from cycling the little read switches all the time. And another flight plan item, at 55 hours even, or there abouts we intended to request another set of photographs of the S4B from you using the data acquisition camera and the sextant, we'll have an updated noun 88 for you later on, over.

SC Okay, and say that time again, Bruce.

CAPCOM Roger, 55 plus 00, over.

SC Okay, and we'll blank the DSKY.

CAPCOM Okay - no need to blank it now.

SC For sleep that is.

CAPCOM Roger.

SC No, I understand, for sleep we'll put it to red.

CAPCOM Roger, Roger. And when you all get your breakfast well prepared, and you're feeling in a jovial why we'll proceed with the Bruce and Bo show on the morning news.

SC Okay, hang on till we all get tuned

SC in. We sure wouldn't want to miss that.

CAPCOM It'll be a couple of minutes yet. We just got the paper here and we're editing it right now.

SC Okay. S4B, Bruce, I was thinking about that, I could see through the sextant. You know, I had 2, it looked like 2 dim stars in the, in the sextant, at that pointing attitude, and I didn't see any tumbling motion at all on either one of them, and they were separated probably by roughly half to 3 quarters of a degree, I'd say .5 to .6 of a degree separation between the 2 but I really couldn't see anything that would determine whether I was looking at the S4B, or a star, a faint star.

CAPCOM Roger, we copy, Stu.

SC I really expected the S - I guess I really expected the S4B to be a little brighter than either one of the 2 objects that I looked at.

CAPCOM Okay, stand by please.

CAPCOM 14, Houston, Stu.

SC Go ahead.

CAPCOM Yea, we've just received the intelligence down here that your family is having lasagna for your breakfast, over.

SC Oh man, that's good timing.

CAPCOM We thought you'd enjoy hearing about it.

SC There's nothing better for breakfast than lasagna, unless it's a sausage onion sandwich.

CAPCOM Very good.

END OF TAPE

SC Houston. Apollo, 14.

CAPCOM Go ahead, 14.

SC Roger, Bruce. I have a few observations about the light flash experiment that I'd like to pass on and perhaps you can generate some information from it that might be useful to us.

CAPCOM Would you stand by a minute, Ed.

SC Okay. Standing by.

CAPCOM Apollo 14, this is Houston. Ed, go ahead with your commentary on the cosmic ray light flashes and we'll digest what you've got and give you our views back probably in a couple of hours. Over.

SC Okay, Bruce. First of all, let me say we all decided to try to darken up - to run the experiment, at least part of it, last night. I think our experience was that we probably saw one flash after dark adapting and probably fell asleep before we saw any more. At least that's true in my case. I think Al and Stu stayed awake a bit longer. However, I think we have seen only 3 types of flashes so far. What we would probably call a star, a supernova, and a flash or rather and a streak and I think that I have seen some - I don't recall a name we tagged to them, but reminiscent of the lightening flashing in there behind the clouds. Those are the only ones that we have really identified and it takes awhile to realize what you are seeing, because it happened so quickly that it takes a little bit of practice before you can really recognize these things. I think perhaps after watching them for another period or so, we will be a little more experienced at it and we hope to do a more creditable job of dark adapting and getting the sort of data that would be liked. My experience is that even the so called star, the supernova are not as clean a phenomena or clear a picture as I had in my mind that they would appear. There still seemed to be at least two flashes, maybe a bright flash, followed an instant later by a more subdued flash, or perhaps a halo-like effect. It doesn't seem to be - there does not seem to be a set pattern in each case. Sometimes it's a very clear single flash. At times it seems followed by a halo. Sometimes it seems followed by an adjacent flash. I guess that's about all I have to say at the moment.

CAPCOM Roger, Ed. I think we've got it all -

SC I'd like to add a few comments on that too, Bruce.

CAPCOM Go ahead.

SC Hey, Bruce. Do you read?

CAPCOM Roger, 14. Go.

SC Okay, Bruce. I'd like to make. You know, you asked yesterday about whether we saw it before we

SC were dark adapted, so last night, I took my flashlight and shined it in both of my eyes and of course, you know, that should ruin any dark adaption that you would have and in fact, you know, you got that risidual glow in your eye for a minute, and then closed them and in one case less than a minute I started seeing the flashes and on the second time around, I'd say it's probably around 2 minutes before I started picking them up.

CAPCOM Okay, Stu. And were you seeing - when you started seeing them, did you see a number of flashes. Ed reported - I think he saw just about one before he fell asleep.

SC Well, what we did was set the timer on 20 minutes and I heard the timer go off and by that time I had only seen 4 or 5 flashes that I could recall. However, at some other periods during the night - that isn't when I did the flashlight routine, that was later on more toward this morning when I started playing with the flashlight and I - in one case, I saw one and then followed not too long after that by 4 or 5 and then I haven't really picked up any pattern on that. You may see one and then 3 or 4 and you may see one and wait awhile. You can't really - it's a little difficult to time it in the dark, you know and get a feel and as far as the - -

CAPCOM Okay. We're switching antennas, Stu.

SC - - three types, however, my supernova - supernova there's explosions in one and very rare I'll see a - discrete pinpoint of light for a minute and then the streaks I've noticed are all - what I would consider over at the periphery of my vision. It just appears that almost all of the streaks are right along the edge of my eye and I get the impression that the majority of these - I run in say longitudinal with the axis of my body. And it seems rare that I see a streak that's right in the center of my vision.

SC This is Ed. I have had a little different experience than Stu has. I don't think that I have seen quite as many streaks as he seems to, but I have seen some that appear to be going from right to left, near the center of the field of vision. However, I have mostly been concentrating on trying to identify the types as opposed to locating them and getting their frequency. I did observe one right after we started to dark adapt about 20 seconds. But nothing after that. And as I say I think I fell asleep sometime within a couple of minutes after that.

CAPCOM Do we have any observations from the commander?

END OF TAPE

CAPCOM Do we have any observations from the Commander?

SC He's busy cooking breakfast right now.

CAPCOM Oh Roger. And I guess we just went through an antenna switchover and we've got some news here if you're all ready.

SC I have only one comment. I think they echo that the others from the light flashes they do seem to be raising sort of a showery type pattern. They are visible in the darkened cabin within a very few minutes after turning the lights off for a time as one or two minutes. And as far as the characteristics of the flashes are concerned, I have observed about what the other guys have.

CAPCOM Roger. We copy, Al.

CAPCOM Apollo 14, Houston. Are you interested in some news?

SC Roger. Press on.

CAPCOM Okay. From the sports world, Marquette's streaking warriors continue to hold forth as the nation's top ranked college basketball power while unbeaten Southern California displaced defending champion UCLA in a runnerup spot. Houston 15 to 3 is a newcomer to the top 20. The Cougars who play Long Island U in Madison Square Garden Thursday night move into the number 18 spot. USC and UCLA will collide Saturday at Southern Cal. Too bad we don't have a TV uplink for you.

SC It'd be pretty nice.

CAPCOM 14, this is Bo Barko. How do you read?

SC Good morning Bo, a lot better. How are you?

BARKO Just fine sir. This is Washington Associated Press. The Food and Drug Administration said tests on compressed fish products such as frozen dinners, fish sticks and fish cakes some mercury content well below the danger level. The FDA said Monday, more than 80 samples contained an average mercury level of .06 parts per million under FDA guidelines - fish with a half part per million is withdrawn form the market.

SC Seems reasonable to me.

CAPCOM The chill blast of a February norther blew into Texas Monday dropping the temperature sharply after the summer like weather which closed out last week. January's last day saw temperatures in the 90s in several points in deep south Texas. And it was one of the dryest month's ever back here in Houston - in Texas. The Dallas weather station for example measured .16 of 16 one hundredths of an inch of rain against the normal 2.32 inches for January.

BARKO The rarest atom particle reported found - New York, Associated Press, physicists from the University of California reported Monday they have discovered the rarest and the most elusive of the nuclear particles that were in the atom. They found the particles track in a photograph of the nuclear interaction. An inch long footprint it left during its brief flight time of 15 billionths of a second. The particle is called the anti-mega-minus baryonon anti particle. The mirror image of matter as we know it on earth. The discoverers related to the idea that somewhere out there in space there are galaxies made up of anti matter just as galaxies are star clusters such as the one we live in - the milky way is made of that matter.

SC Hey Bo. I think I saw one of those just go by the window.

BARKO Grab it quick. Hey, Stu.

SC How long did you say the track was? Bo - how long did they say the track was that they had seen?

BARKO An inch long footprint it left during its brief lifetime of 15 billionths of a second. They say we had a standing offer of a case of champagne to whoever found it, Goldhaber said, when I get back to the Lab I have to deliver.

CAPCOM Do you think Stu qualifies for one also?

SC All right. Let it get away Bruce.

SC That's a pretty great piece of news.

CAPCOM Okay. On Wall Street, investors bought heavily on Monday giving the Dow Jones Industrial average its highest single day gain of the year. The Dow Jones average of 30 industrials stocks closed up at 877.81 up nine points 31. for the biggest one day jump in 71. Trading was heavy throughout the session with the New York Stock Exchange ticker backed up a minute or more several times during the day. The tape was 3 minutes late at the close.

BARKO Washington - UPI - The administration is considering a pollution tax such as a levy on emissions of air polluting sulphur dioxides. In an effort to give industry an incentive to clean up President Nixon's economic report said Monday. The report prepared by the President's council of economic advisors and sent to Congress under Mr. Nixon's signature said a tax may be a more effective way to control pollution than direct government regulation.

CAPCOM At 9:03 tonight the Apollo 14 crew will begin operating under NASA's own version of daylight savings time. The readjustment of the mission clocks will bring the flight back to the actual real time (Greenwich mean time) for activities as scheduled in the flight plan. At 9:03 PM

CAPCOM the flight will be 54 hours into the mission. However, under the nominal flight plan the 54 hour mark should have been reached at 8:23. To correct this, the crew will move their mission elapsed time clock ahead 40 minutes to coincide with the real time clock.

BARKO This is by Francis Dodds, Austin - A bill creating an upper level college at Clear Lake as a branch of the University of Houston has been approved by the Senate Education Committee. The bill introduced by Senator Chet Brooks of Pasadena will create the University of Houston Clear Lake Campus primarily to serve six area junior colleges. A proposed 360 acre campus is adjacent to the Manned Spacecraft Center. The proposed college must be started immediately Hoffman said for two reasons. To be of service to San Jacinto Junior College, Alvin Junior College, Brazoport Junior College, Lee Junior College, College of the Mainland and Galveston Community College and to help limited enrollment at the University of Houston's main campus to 30 000. And then on later it says the University of Houston Clear Lake would accept students with 56 or more semester hours and would offer degrees to the masters level.

SC That's pretty interesting news.

SC Yeah.

CAPCOM Rochester, New York. Brooks Robinson outstanding player in the World's Series with his glove and bat was named Monday night as winner of the 21st annual Hickok professional athlete of the year award. The 33 year old third baseman of the baseball champion Baltimore Orioles won by a large margin over another veteran - 43 year old George Blanda, quarterback of pro football Oakland Raiders. Robinson who hit 428 in the World's series and made a series of those spectacular fielding plays in the 5 game triumph over the Cincinnati Reds received 62 of the 146 first place votes by a panel of sports writers and newscasters. And that winds up the news for this evening down here - this morning up there. Goodnight or morning Bo.

BARKO I'm going home and have dinner.

SC I thank you guys.

SC Didn't understand that bit about changing the time on the Apollo 14 crew. I can't figure what those guys are doing that for.

SC Hey, that was a good newscast. You know you're pretty high in the ratings up here.

CAPCOM Okay. Thank you. Appreciate it.

PAO This is Apollo Control at 51 hours 56 minutes. Helping out CAPCOM Bruce McCandless on reading

PAO the news there was astronaut Karol Bobko. And at the present time Apollo 14 is traveling at a velocity of 3002 feet per second and we show the current altitude 162 934 nautical miles from earth.

END OF TAPE

PAO This is Apollo Control at 52 hours 2 minutes. We'll be coming up in the next few minutes on the bistatic radar frequency check. This will be a check of the spacecraft communications frequencies on the unified S-band and the UHF in preparation for an experiment.

CC This is Houston. When you're configured in a suitable VHF mode for the S170 bistatic radar frequency check, give us a call, and then we'll secure the S-band uplink for about 5 minutes on you. There's no great rush involved in this.

SC Okay. We'll start to configure now and give you a call.

CC Roger.

PAO The bistatic radar experiment, which will be performed in lunar orbit, will utilize the spacecraft unified S-band and VHF transmitters to reflect radio signals off the surface of the moon. And these will be received on earth and hopefully the -

SC We're configured on the flight plan at 52 hours. Standing by.

CC Roger. We're going to go ahead and secure our S-band uplink. Delay that 14. We're going to wait until your rotation in PTC brings us around to the point where we can utilize OMNI BRAVO for the frequency measurement and I'll give you a call just prior to our turning off the uplink.

SC Okay, Bruce.

SC Houston, 14. Speaking of daylight savings time. Our sun comes up very regularly every 20 minutes.

CC Roger. We copy.

CC That's probably not unreasonable for the small size planet you're in right now.

PAO Ed Mitchells comment about the sun coming up every 20 minutes refers to the fact that the spacecraft is currently in its passive thermal control mode or it's rotating at the rate of 3 revolutions per hour or 1 revolution every 20 minutes.

CC Apollo 14. This is Houston. We're going to secure the S-band uplink for approximately 4 minutes 5 minutes at this time. If you need us for anything, just give us a call. We can still receive you. We still have TM and we'd bring the uplink back up. Over.

SC Roger. You're turning the S-band off now. Is that affirm?

CC Roger. We are turning the uplink portion of S-band off at the present time.

SC Okay.

CC Roger. Out.

CC Apollo 14. This is Houston. On S-band we have the uplink back up. We would like to leave the VHF

CC configured as is, however you'd better call about 20 minutes from now.

CC Apollo 14, Apollo 14, this is Houston. How do you read?

SC You're loud and clear, Bruce. 14.

CC Roger. As you may gather. We have the uplink back up at this time. We'd like to remain in the existing VHF COMM configuration until we give you another call. That'll be about 20 minutes from now. Over.

SC Okay. We're easy to get along with. We'll stand by on this configuration.

CC Roger. Out.

CC Apollo 14. This is Houston. Over.

SC Go ahead.

CC Roger, Ed. Down at the Cape there's a Thor Delta with a NATO communications sattelite on it that is about 1 minute and 40 seconds from ignition. If you're in such an attitude that you can view the Cape, you might try a P22 and pick it up in the sextant. Latitude 28.5, longitude over 2, 45.5. I say again, 28.5 and 45.5. That's your option. Over.

SC Okay. I don't think we're going to be around in time. Al's looking at the earth out the window 5 right now.

CC Okay. Maybe you could try the monocular. But it probably doesn't hold much hope.

SC Okay.

SC Yes, he's got the monocular out now and that's 28.5

CC Roger. 28.5 lattitude.

SC Cooridinates

CC Latitude 28.5 and longitude over 2, 45.5.

SC Okay. 28.5 45.5. We'll try it and Al's looking with the monocular now.

CC Roger. Longitude over 2 is negative 40.5, negative 40.5.

SC Okay minus 40.5.

CC Okay, Stu, 321 ignition, down at the Cape.

SC Okay. I didn't get the optics on it. The earth wasn't quite around. It just went out of the number 5 window just before you come.

CC Roger. We just thought we'd send the info up in case you happened to be in a handy attitude.

CC Apollo 14, this is Houston.

SC Go ahead.

CC Roger, Al. We thought you might be interested in knowing we have a Dr. House down here at the Surgeons console for a few minutes watching the progress

CC of the mission.

SC Good evening, William. Glad to have you aboard.

CC He's waving back.

SC Tell him everythings fine.

END OF TAPE

SC Tell him everything's fine, Bruce.

CAPCOM He rogers that. We understand that Doctor House is the surgeon who performed the successful operation on Al Shepard's ear, which cleared up the inner ear problem, and is allowing him to make this flight.

PAO This is Apollo Control at 52 hours 47 minutes. Flight dynamics officer, Dave Reed has just completed briefing the flight controllers here in the control center on the procedures that will be followed and the rational for the clock update, which is scheduled to occur at about 54 hours 45 minutes, at which time the clocks in the computer complex here will be reset ahead 40 minutes and essentially placing us back on the flight plan, both in terms of ground elapsed time and in terms of central standard time. One of the finer points being considered at the moment is whether to update precisely 40 minutes, or to update 40 minutes and 3 seconds, which is in fact the exact amount of time that was made up in the maneuver. In other words the point at which the spacecraft crosses the 180 degree maridian, if we update 40 minutes and 3 seconds we will be precisely on the GET at which that event will occur, and at the present time the vote here in the control center as to whether to update 40:03 or 40:00 stands at 1 to nothing in favor of 40:03, and we'll let you know how the polling progresses. For the most part no one seems to have too much of an opinion. The reaction seems to be about the same as the reaction that came in from the post flight evaluation team which is going to have to sort out all of these numbers and make everything agree and see that nothing gets confused, and that reaction was something to the effect of, if you have to update, do it any way you see fit. One point that Dave Reed made, was that precautions will be taken to see that, in addition to keeping people from getting confused by the update, to see that the computers are also not confused by the update. In describing the rationale for the update, we mentioned that the booster, the saturn 3rd stage, the S4B is targeted to place the spacecraft at the moon at the proper sun time regardless of the time that it lifts off from earth. Recognizing then that the lift off time was 40 minutes late, the booster guidance system targeted a trajectory which was some what flatter, which arrived at the moon approximately 40 minutes earlier than it otherwise would have, and we're now in the process through this flight plan update, through GET update rather, of making the clock and the flight plan once again agree, and as I mentioned, once the update is carried out, the GET time on the clock here in mission control

PAO will once again agree with the flight plan and the times that are in the flight plan reference to central standard time, will also be back in synch with the current central standard time.

CAPCOM 14, this is Houston. We've concluded the VHF measurements. You can turn VHF ranging and the VHF switches off.

SC Okay, thank you.

CAPCOM During the bistatic radar frequency check which was just completed, the spacecraft VHF signal was being received by a 150 foot dish antenna at Stanford, and the spacecraft unified S-band signal was being received by the 210 foot dish at Goldstone California. Reception of these signals will allow teams at these 2 receiving locations to get a frequency calibration which will later be used during the period of orbital science when the bistatic radar experiment is performed from the command module, basically this experiment consists of reflecting the UHF and, VHF and S-band signals off the surface of the moon, and when they're received back on earth certain conclusions can be reached about the dielectric characteristics of the lunar surface. At 52 hours 59 minutes Apollo 14 is 164,717 nautical miles from earth and the spacecraft velocity is now droped below 3,000 feet per second. We're currently reading 2,954 feet per second.

SC Okay, Bruce, did you get the torquing angle?

CAPCOM That's affirmative, Stu. And do you have a time for us?

SC Hello Houston, 14.

CAPCOM 14, this is Houston loud and clear. We have your torquing angles, do you have the time for us? Apollo 14, Apollo 14, this is Houston, can you read?

SC Okay, read you loud and clear Bruce. Did you have lock up? Did you get the torquing angles?

CAPCOM Roger, we've got the torquing angles. Do you have a time at which you torqued for us?

SC Rog, that was 53 plus 11 plus 30.

CAPCOM Roger that.

END OF TAPE

CAPCOM Apollo 14, this is Houston. We'd like to get battery BRAVO on charge now. Over.

SC Okay. Will do. Battery BRAVO.

END OF TAPE

PAO This is Apollo Control at 53 hours, 58 minutes. We're now just about 45 minutes away from the scheduled updating of the clocks here in Mission Control. The flight plan calls for the GET update to occur at about 54 hours, 45 minutes. However, the precise timing of it is not critical. And it will more than likely be done at some point when we're in communication with the crew and when the timing is right as far as making the changes in the real time computer clock complex. The flight dynamics officer has come up with a new set of coordinates for the predicted S4B impact on the moon. They are as follows: 8.4 degrees south and 25.9 degrees west, and the predicted ground elapsed time of impact is 82 hours, 37 minutes, 42 seconds. And of course that GET time will be updated by approximately 40 minutes. You'll be able to add about 40 minutes to that time to get the post update ground elapsed time of impact. The update will be 40 minutes and 3 seconds. The straw vote that was taken in the control center turned out one to nothing in favor of 40 hours - 40 minutes, 3 seconds as opposed to 40 minutes, 00 seconds. The retro-fire officer was the only one voting and it was his preference that we do the update 40 minutes, 03 seconds, which puts the flight plan precisely in synchronization with Greenwich Mean Time at that time. The things that were considered in making that choice - updating by 40 minutes and 3 seconds as opposed to 40 minutes and 0 seconds, in the one case, it makes the flight plan and the ground elapsed time perfectly in synchronization with no seconds left over. However, in updating 40 minutes and 3 seconds as opposed to 40 minutes and 0 seconds it complicated computing back to get the real ground elapsed time. The difference, of course, relatively minor and since the only one who really seemed to have a preference was the retro-fire officer, flight director Milton Windler decided to yield to that preference and we'll update by 40 minutes and 03 seconds adding that amount of time to the current ground elapsed time. I would like to repeat also an announcement that was made earlier and that is that the television scheduled for the next shift at 408 central standard time has been moved up one hour. This was done because of the deletion of the mid-course correction of mid-course correction 3 opportunity. That maneuver is not needed and will not be performed in order to keep the LM housekeeping acitvities all on the same shift. The flight plan was in effect condensed - everything moved up an hour and the television which is associated with the LM housekeeping was also moved up, so that the current schedule for the TV is at 308 a.m. tomorrow morning. At the present time we show Apollo 14 traveling at velocity of 2906 feet per second and the altitude is 166,487 nautical miles.

END OF TAPE

CAPCOM Apollo 14, this is Houston, over.
SC Go ahead.
CAPCOM 14, Houston, I've got a string of pads here for you, starting off with a flight plan update and a little later a T ephem update and 2 maneuver pads. When you're ready to copy, let me know.
SC Roger, Bruce. Some figures here, we're just finishing up one of the experiments. We'll be ready in a minute.
SC Houston, Apollo 14. Ready to copy.
CC Roger, 14. On the flight plan update. At 55 plus 40 PGETLOU. We'd like to perform some more S4B dim light photos in PTC using P52 with the following NOUN 88 unit vectors.
SC Stand by.
CC 14, this is Houston. How do you read?
SC Okay, we're reading loud and clear.
CC Okay. Did you copy any of that?
SC Just how do you read that's the first part is what we got.
CC Any of the flight plan update?
SC Negative. (garble)
SC Houston, 14. We're not reading you.
CC Okay. How now, 14?
SC Okay, go ahead.
CC Beautiful. Alright, flight plan update at 55 plus 40 PGET LOU perform S4B dim light photos while in PTC using P52 with the following values per NOUN 88, R1 minus 47607 minus 79244 minus 38131, Camera procedures and film magazine will be identical to those for the earth darkside photos. The S4B should be visible in the sextant between roll angles of 078 degrees down to 005 degrees. Over.
SC Okay, at elapsed time of 05540 we will again take the S4B photographs in the P52 NOUN 88 minus 47607 minus 79244 minus 38131 using camera magazine and earth darkside photographs. The sextant roll angles including 078 down to 005.
CC Roger. Readback correct. And that 5540 time is the Post GET liftoff update time and we're preparing to give you a liftoff time update now.
SC Understand. That's new time.
CC Roger.
CC 14, Houston. T EPHEM update. Over.
SC Go ahead.
CC Roger. T EPHEM OID0300006 identifier 04 35223 identifier 0516020, the DELTA in time is 40 minutes 02.9 seconds added to GET and subtracted for T EPHEM. Over.
SC Okay, the update identifier 0300006 identifier 04 35223 identifier 0516020, the DELTA T 40 minutes 02.9 seconds add to GET .
CC Houston. Roger. Out. And I have an update

CC to your liftoff plus 60 pad.

SC Okay, go ahead.

CC Okay, on P37 liftoff plus 60 060005381 minus 16511700. Over.

SC Roger. GET time is 060005381 minus 16511700.

CC Readback correct. I have a change to the previously passed SPS

END OF TAPE

CAPCOM Readback correct. I have a change to the previously pass SPS G&N flyby pad P-30 for you. Over.

SC Okay. Go ahead.

CAPCOM Roger. The time of TIG NOUN 33 should be 077 39 minutes 3444 seconds and down at the bottom of the pad GET of .05 g should be 165 52 28 and both of these last pads assume the GET update. Over.

SC Okay. NOUN 33 of the LOI minus 5 is 077 39 3444 and GET is 0 - .05 g 165 52 28. The rest remains the same.

CAPCOM Roger. Readback is correct.

CAPCOM 14 Houston. Now you're figured in P00 if you can give us ACCEPT we will send you a state vector update to improve your pointing accuracy for the S-IVB photography and a liftoff time update to adjust the GET in accordance with the pads that we've passed you. Over.

SC Okay.

CAPCOM And 14, we're going to hold off for a few minutes here on the uplink till we get a good antenna switchover and that'll be coming at you.

SC Roger. Understand.

PAO The uplink that CAPCOM Bruce McCandless was referring to is the elapsed time update and that will be uplinked via telemetry to the spacecraft clocks and shortly after we would expect the clocks here in Mission Control also to be updated.

SC In the metal composite specimen number 4 has been cooked and cooled and recorded.

CAPCOM Thanks a lot.

PAO The Guidance Officer reports that he's ready now to uplink the revised elapsed time to the clocks onboard the spacecraft. And Guidance and Retro report that we're now updated onboard.

CAPCOM The uplink is completed. I'd expect you'll want to reset your mission timers.

SC Okay. We'll do that. And we'll also call (garble)

CAPCOM Okay. Thank you.

PAO And our telemetry data now shows the spacecraft Command Module computer clock to be reading 553430. Once the update is completed here in the control center we'll have one clock which will be designated G.E.T. and will be reading the updated ground elapsed time. Next to that, the clock designated TV-5 will be reading the original or actual ground elapsed time and of course we'll lag 40 minutes 3 seconds roughly behind the updated GET clock. And we just had the clocks here in the Control Center updated and we're now on Liftoff savings time -

SC 53 T EPHEM for us?

SC My update was 16020.

CAPCOM Okay. Stand by we'll be glad to -

PAO This is Apollo Control. Our revised time now reading 55 hours 46 minutes 22 seconds. Those elapsed time updates were made at following times 54 53 30 on the spacecraft and that command was uplinked by the Guidance Officer.

SC Go ahead.

CAPCOM Okay. I've got a few words on the T EPHEM situation. Probably the most -

SC Go ahead.

CAPCOM Probably the most significant part of the whole discussion is that both values of T EPHEM are correct and the way that they arrive at this is as follows. The left hand most digit of the octal representation of T EPHEM is coded to include a sign. If you break the left hand most digit down into the 3 binary bits, the first bit being zero represents positive. The first bit being a one represents negative. In the value of T EPHEM, update on the pad you'll notice that in the R3 load it was 16020 which is a positive one - -

END OF TAPE

CAPCOM 020, which is a positive 16020. In the value that you read out of the command module computer, you will notice that R2 was 1 least significant digit larger than the pad value. That is 35224, and R3 having the left hand most digit of 5, was in reality, equal to a minus 16017, which is then subtaacted from the 1 digit larger value of R2. Does that make sense to you all, over.

SC I affirmative. In other words you want us to leave the loads the same.

CAPCOM Roger, either load is correct. The command module computer does not force a positive sign or a negative sign on the octal value, but accepts what ever it happen to come up with, so either load is correct, over.

SC Okay, assuming we have no more updates, how would you like us to update the T EPHEM of the LM, using the 1706 values.

CAPCOM 14, this is Houston. I'll catch you when signal strength comes back up.

SC Okay.

CAPCOM 14, this is Houston.

SC Go ahead.

CAPCOM Roger, back on the question of which set of T EPHEM to load, you can load either one in the LM. If you want a recommendation, we recommend the pad value, but either one would be satisfactory, over.

SC Okay we'll call 1706 when we make our load. Thank you.

CAPCOM Roger.

SC And Houston, 14.

CAPCOM Go ahead, 14.

SC Okay Bruce, we've got something in the sextant with those angles. It could be the S4B, it's right off to the edge in the sextant field of view and being tracked by the CMC on those angles, and I'll look at it again on the next pass, and take some pictures of it after that.

CAPCOM Okay, Stu, very good. Could you tell that the object was tumbling, or anything like that, do you think?

SC I'll, I'm going to look at it again.

CAPCOM Roger.

CAPCOM 14, this is Houston. For your information, the major tumble motion now has a period of 5 minutes and 46 seconds on the S4B, over.

SC Okay, thank you.

PAO This is Apollo Control at 56 hours 9 minutes. Apollo 14 now 168,880 nautical miles from earth, and the spacecraft velocity, 2,842 feet per second. In mission control at this time, we are in the midst of a shift handover. Flight Director on the shift coming on is

PAO Jerry Griffin. Of the gold team of flight controllers, the capsule communicator will be astronaut, Fred Hayes. We are planning a change of shift briefing in the MSC news center briefing room, and we estimate that, that briefing will be ready to begin in about 15 minutes.

END OF TAPE.

SC Houston. 14.

CAPCOM Alright. Go ahead, 14.

SC Okay. Yes. You really got the S4B coincided with those angles. Now the other cycle around I picked up a star that's also in the field of view and the S4B is tumbling and you can see it right at the start when it comes in on this one and then it disappears and comes back in right toward the end. So we're definitely locked in with those pointing angles that's got the S4B right near the center of the sextant and what I picked up the first time around evidently is a star and it's over toward the edge of field - of the field of view.

CAPCOM Okay. And - understand you're going to try see that the next time around, huh?

SC Yes. We'll try to get some pictures - I guess I'll try to - I think I'll look at it one more time and try to get a time frame or roll angle where it's visible in the sextant and then try to take the pictures at that time.

CAPCOM Okay, Ed. That sounds good. It isn't going to be going anywhere.

SC Okay. No, we'll be hanging around here for awhile.

SC Houston, 14.

CAPCOM Go ahead, 14.

SC I just wanted to say good morning so I'd know how to talk to you today.

CAPCOM Well, good morning. That isn't quite good morning, yet.

SC Houston, 14.

CAPCOM Go ahead, Ed.

SC In case I don't remember, yesterday I was talking about the oil canning effect that the heat contracting - the heating and cooling of these panels.

CAPCOM Roger.

SC And remember you said it looked like the same thing that was happened to LM7.

CAPCOM Affirm.

SC Okay. I thought I'd let you know that I think our oil can wrinkles are prettier than LM 7's oil can wrinkles.

CAPCOM Okay.

PAO This is Apollo Control, 56 hours 32 minutes ground elapsed time. Here in the control room the Gold Team flight director Jerry Griffin is conferring with the various console engineers, finding out what items have to be covered during the next 8 hours of the shift. Each man goes red on the flight director's status board and after he completes the conversation the button goes green. The offgoing flight director, Milton Windler, is now in route to the Houston News Center for Change of Shift

PAO Press Conference. He is accompanied by his flight dynamincs officer, Dave Reed. The group should be at the News Center in about 10 minutes to begin the Change of Shift Press Conference. Apollo 14 now 169,565 nautical miles from Earth, velocity 2823 feet per second. At 56 hours 34 minutes ground elapsed time this is Apollo Control.

END OF TAPE

PAO This is Apollo Control. The Change of Shift Press Conference with the off going Flight Director Milton Windler is going to start momentarily in the small briefing room in the Apollo News Center in Houston. 56 hours 40 minutes GET. This is Apollo Control OUT and accumulating tape until after the Press Conference.

END OF TAPE

PAO This is Apollo Control 57 hours 3 minutes ground elapsed time. We have about a minute and a half of accumulated air to ground voice tapes that were recorded during the Change of Shift Press Briefing which is now finished. We'll play those tapes back. Meanwhile, Apollo 14 is now 170 374 nautical miles out from Earth, velocity continuing to decrease 2802 feet per second. Let's listen to that minute and a half of tape and then rejoin the air to ground live for any conversation perchance develop between ground and Apollo 14. Let's roll the tape.

SC Houston, 14.

CAPCOM Go ahead 14.

SC Hey, Fred, just for curiosity sake just how far away is the S-IVB?

CAPCOM Stand by.

CAPCOM 14, Houston

SC Go ahead.

SC Do you have any estimate as to how the S-IVB is away, Stu.

CAPCOM Stand by one.

SC Hey, Fred, Apollo 14.

CAPCOM Go ahead.

SC Okay, after looking through the optic and judging the size and its relative motion through the celestrial sphere, I estimated at 2178 miles from us.

CAPCOM Stu, you might replace the rendezvous radar yet. The number they gave me was 2400 nautical miles. (garbled) going away at about 1 nautical mile a minute.

SC Okay.

PAO This is Apollo Control. That completes the brief accumulated tape of the communications between the Apollo 14 and the ground. We're back live now on the air to ground circuit, continuing to monitor as long as the crew is awake. Fifty-seven hours 6 minutes ground elapsed time. This is Apollo Control.

CAPCOM Apollo 14, Houston.

SC Go ahead, Houston.

CAPCOM Okay. Have you verified the ascent switch at GDC.

SC Okay. It's verified, Houston.

CAPCOM Alright.

END OF TAPE

CAPCOM Apollo 14, Houston.

SC Go ahead, Houston.

CAPCOM Okay. If you can give us an accrual accept we'll pump up a CMC clock update.

SC Okay, accrual accept.

CAPCOM Apollo 14, Houston. The computer's yours.

SC Okay, thank you.

CAPCOM 14, Houston.

SC Go ahead, Houston.

CAPCOM Okay, FAO would like to know about when Stu took the S-IVB pictures and how much you got remaining on that sequence camera mag.

SC Okay, Houston, standby one.

SC Okay, Fred, I took them - sort of reverse order but in using pretty much the same procedures (garble) however, I think I'm going to end up with streaks on the film because you know the way the CMC tracks the objects but at 57 hours even I took, I ran 2 seconds at 24 frames per second five hundredth and then I took 1 frame at 1/60 for 20 seconds, 1 frame at 1/60 for 5 and then at 57:20, I took one frame at 1/60 for 50 seconds and had to cut it off there, couldn't get a full minute and then ran off another strip and I'm calling it 78 percent left on the magazine.

CAPCOM Okay, Stu. I copied all of that, thank you.

END OF TAPE

CAPCOM Apollo 14, Houston.
SC Go ahead, Houston.
CAPCOM Got a little configuration change for you on panel 226. We'd like to get O2 tank 50 watt heater number 3 main A open.
SC Okay. Let's run that again now. It's O2 the 50 watt heater on O2 tank 2.
CAPCOM Negative. O2, 3 main A. 3 main A, Stu. And the reason is they want to look at a couple of cycles which is two elements of the heaters going out on 3.
SC Okay. On O2 tank 3 we pull the main A 50 watt heater.
CAPCOM That's affirm.
CAPCOM And we'll stay with that configuration through the evening so we can get at least 3 or 4 cycles on it.
SC Okay.
PAO This is Apollo Control 58 hours 2 minutes ground elapsed time. Apollo 14 currently 171 932 nautical miles out from Earth. Velocity continuing to decellerate now at 2761 feet per second. Current ground elapsed time for midcourse correction number 4, if it should indeed be performed, is 77 hours 38 minutes 24 seconds. RCS burn of about 3 feet per second. Current estimates on the S-IVB impact, time of 83 hours 17 minutes 45 seconds. Latitude 8.4361 south, longitude 25.9365 west.

END OF TAPE

PAO The calculated weight of the spacecraft, the docked weight of the CSM and lunar module is 97 143 pounds. Continuing to leave the air-ground circuit open at 58 hours 3 minutes, ground elapsed time this is Apollo Control.

CAPCOM 14, Houston.

SC Go ahead.

CAPCOM Okay. There's a request from down here to run through a little four step exercise in having Al check his electro leads and see if we can find anything early here, so we got time to do something about it before ya'll get around to the suiting up part of it. And I guess that's at Al's convenience in the next few hours and everything so he can work it in maybe.

SC Okay, we're fixing to have lunch right now, let Al think it over to see when he wants to try to do it.

CAPCOM Okay.

END OF TAPE

CAPCOM Apollo 14, Houston.
SC Go ahead, Houston.
CAPCOM Okay. We're ready to terminate charge on battery B.
SC Okay.

END OF TAPE

SC Houston, 14.

CAPCOM Okay, 14, standby one. Until I can get a better com line (garble)

CAPCOM 14, Houston. How do you read now?

SC Okay, read you loud and clear. This is Al. Understand you're still having a problem with my sensors.

CAPCOM Negative, Al. The situation is you did have the problem for launch and then it mysteriously went away and what they'd like is visual inspection of the gear to see if we have anything that looks abnormal that we might think about fixing at this time rather than wait until just before suit-up time where we'd like to not fiddle with anything.

SC I have checked all the sensors, Fred, and they all seem to be firmly in place. They don't appear to have moved. I did have some garble in the gober cable at one time and that has been changed and now you can compare gober cables that might have made the difference. I can switch back to that and take a check on that one if you want to.

CAPCOM No, I don't think that's necessary. I might just tell you what they had in mind here and see if you - to kind of cover all of the places they wanted you to check around each of the electrodes they wanted to know if you had any of the paste that appeared to leak out that you could see stain under the large round pieces of tape you got over them, was the first item. Then another inspection thing was to look at the solder joints that's the areas that had the little plastic sleeves over them, to see if you could see anything that appeared to be cracked or coming loose in there and I guess the last inspection item was the - in your bio-belt to check that the top and bottom connectors on the blue, the little blue EKG signal conditioner was all tight.

SC Okay, we have one that appears to have leaked a little bit. It's the bottom one on the sternum.

CAPCOM Okay, the bottom one on the sternum. Okay, and I guess the only other square which should be pretty easy to fill here, Al, is looking at your data now is to sequentially put some firm pressure on each of the three sensors for about 10 seconds giving a call down when you're applying the pressure.

SC Okay. Understand you're ready now?

CAPCOM That's affirm looking at your data now.

SC Okay, in the top (garble) I am pressing down the one closest to the right sholder now.

CAPCOM Okay.

SC And I'm releasing on that one now.

CAPCOM Okay.

SC On the top of the sternum I'm pressing down the center one now.

CAPCOM Roger, Al.

END OF TAPE

SC Releasing that one now?

CAPCOM Okay.

SC The top of the sternum pressing down the center one now.

CAPCOM Roger, Al.

SC And releasing now.

CAPCOM Okay.

SC Okay. And the bottom of the bottom of the sternum the ones that appears to have leaked a little bit I'm pressing down now.

CAPCOM Okay.

SC And releasing now.

CAPCOM Roger.

SC (garbled) released.

CAPCOM Okay. I think that fills all the items I got here, Al.

SC Okay. This is Al, Houston. I understand that we're cleared to continue with the present harness and cable configuration.

CAPCOM Yes. For the time being that's the word, Al. But they're going to look at the data. I guess the bottom one you pushed on showed more change than the others and I they're going to look at it a while and decide if they want to do anything about that bottom one I guess.

SC Okay.

SC Houston, 14.

CAPCOM 14, Houston.

SC Apollo 14.

CAPCOM 14, Houston. I can barely make you out there. Go ahead.

CAPCOM Okay, 14. Houston. You should be alright now. Go ahead.

SC Okay, Fredo. Inquiring about the LM/command module delta P pass at 59 hours, is that number 2.7 still good since we have already been in the LM and had a problem with our probe?

CAPCOM Stand by one.

CAPCOM 14, Houston. The answer is the 2.7 number is a good one.

SC Roger. Roger.

SC Apollo 14. We have the all bias check if you're ready to copy.

CAPCOM Okay. Go ahead, Al.

SC At the end of the 100 seconds it was reading minus 98.9.

CAPCOM Okay.

END OF TAPE

APOLLO 14 MISSION COMMENTARY 2/3/71 1:29CST 59:06GET MC-183/1

PAO This is Apollo Control, 59 hours 10 minutes ground elapsed time. Most recent conversation very breif exchange some moments ago about some spurious signals or at any rate some problems with one of the sensors on spacecraft commander Shephards' medical harness. And they wanted to get the problem sorted out prior to the time the crew suited up for the lunar landing. Apparently it's just some looseness in the sensor and the surgeon is toying with the idea of perhaps having him put some additional paste underneath the sensor and another piece of tape. This will be resolved at some later time. Here in the control room, the spacecraft communicators are having a seperate handover from the rest of the flight control team. Apollo 14 backup lunar module pilot, Joe Engle is placing Fred hayes at the Capcoms' console. Apollo 14 now 173 754 nautical miles out from Earth, velocity 2712 feet per second. 59 hours 12 minutes ground elapsed time, still up live on air-to-ground and looking at a TV pass to begin later in the morning as the crew begins the housekeeping chores in the lunar module. This is Apollo Control.

END OF TAPE

SC Houston, 14. O2 heaters configured per flight plan.

CAPCOM Rog, Al.

END OF TAPE

CAPCOM Apollo 14, Houston.
SC Go ahead, Houston.
CAPCOM Okay, Al. First we got some words for you on the replacing this lower ECG sensor and it'll be just taking it off and cleaning it and replacing the same one.
SC Okay.
CAPCOM Okay. The materials that you're going to be needing are all in the medical kit over in R8 and what you'll need is one of those large pieces of tape and one of the rings that fit on the sensor. And the paste that's in the plastic bottle. And all these are in the kit.
SC Okay.
CAPCOM Okay. And you can do this at your convenience, Al. There are just a couple of things that we wanted to make sure you get cautioned on. I'll go ahead and go through the procedures here and if there's anything that you want gone over again, well, just holler. First, remove the tape and the sensor and clean your skin with one of the wet wipes. And then wipe the paste from the inside of the sensor. Wipe the sensor itself out first and then pull off the old piece of tape. That's that double sticky-back. It looks like a round double stickyback scotch tape. Pull that off after you've cleaned the sensor out. Then take the new ring and pull off one of the pieces of card-board on the ring and put it on and leave the other side covered. Then put the paste in the sensor. And after you've got the paste in there level, pull the other side off so that it's stickyback is showing and put it back on your skin then.
SC Okay. I understand. I'll give you a call and ask you questions. That sounds pretty good.
CAPCOM Okay.
CAPCOM 14, Houston.
SC Go ahead.
CAPCOM Okay. We'd like you to put off doing the water dump in a little bit here I'll have the flight plan update with some instructions to shoot some pictures when we have you do that.
SC Okay. You caught me just in time. I was on my way to the dump valve now.
CAPCOM Read your mind, Ed.
CAPCOM Which dump was that?
SC Okay. Did you get the torquing angles, Houston?
CAPCOM We got them.
SC Okay. I trust you're going to put it off until after we've finished with the LM and the TV show, et cetera. Is that right Fredo?

APOLLO 14 MISSION COMMENTARY, 2/3/71, 2:00 CST, 59:38 GET, 185/2

CAPCOM Yes. I think the pictures, they're wanting are from the LM site.

SC Okay.

SC And Fred, the time on that torquing was 59:41:10.

CAPCOM Okay. 59:41:10.

SC Roger.

END OF TAPE

APOLLO 14 MISSION COMMENTARY, 2/3/71 59:44 GET 186/1

DEAD AIR

END OF TAPE

CAPCOM 14, Houston.

SC Go ahead.

CAPCOM Hey, I got point plan update for you here and a whole bunch of words on shooting the water from the LM.

SC Okay, go ahead, I'm ready for the flight plan update.

CAPCOM Okay, at 60 hours and 40 minutes where you maneuvered a TB atitude, we need to change the roll angle to 069 and as a result of that we also change the high gain angles to minus 66 pitch and yaw 105.

SC Okay, Fred, I got the high gain angle of a minus 66 and 105 and say the new atitude for TV.

CAPCOM Okay, it's - the only thing changed is the roll angle to 069, so it will be 069, 090, 000.

SC 069, 090, 000, minus 66 105.

CAPCOM Okay. Now some words on the water dump, like to delay the waste water dump to 62 hours and 30 minutes. Rather than the 59 50 that it had previously been set at.

SC Okay, I got it. Waste water dump at 62 30 and say after that.

CAPCOM Okay, the after that was just a scratch out the 59 50 you had before. Now some words on the camera operation, Al and Ed should take over to the LM with them magazine F out of the B8 cushion and borrow your 18 mm lens out of the command module.

SC Okay, and they'll take magazine F out of B8 and I guess I'll let them borrow my 18 mm to take in the LM.

CAPCOM Okay, just make sure they give it back to you, but when they get it over there they can stick it on the LM deck and ..

SC They'll have to sign a receipt.

CAPCOM Yeah. And put the following settings required on the LM deck. F8, 12 50th, 11 feet and 24 frames a second.

SC Okay, put the 18 mm on the LM deck and set her up F8 12 50th 11 feet and 24 frames per second.

CAPCOM Okay, and to run the camera, of course, they're going to need the sequence camera circuit breaker closed and that actually fits in pretty well if they just do all this business right where that's called out on page 116 step 9 of the activation list.

SC Okay, they'll need the sequence camera circuit breaker in and we're talking about page 116 step 9.

CAPCOM Rog, and if that doesn't quite aline with the flight plan time I give you that 62 30, it isn't going to matter that much anyway.

SC Okay.

CAPCOM Okay, now they need a que from you Stew, to let them know when you're going to start the dump. And what they'd like them to do is have the camera pointed through the docking window of the LM, the upper window, right at the vent and run it 20 seconds worth at 24 frames.

SC Okay, they'll board sight on the vent and run her 20 seconds at 24 frames.

CAPCOM Okay, then they like to change the frame rate to 1 and run the camera for another 20 seconds.

SC Okay, change to 1 frame per second and run 20 seconds.

CAPCOM Okay, after that chore, they can rest a while and wait til you get down to the end of the water dump, Stu, and you can kind of give them the word when you're ready to shut her off. And then they'd like them to shoot the vent again at 24 frames a second for 10 seconds.

SC (static) vent (static)

CAPCOM Stand by one, Stu, we got pretty bad com now.

CAPCOM And, Stu, how do you read me now?

SC Loud and clear, Fred.

CAPCOM Okay, we left off with them shooting 24 frames for 10 ... .

END OF TAPE

CAPCOM - - then shooting 24 frames for 10 seconds when you turn the valve off.

SC That's affirmative.

CAPCOM Okay. Then they're to change the frame rate to one frame per second and run the camera for at least 60 seconds or until cloud particles are no longer visible, but I guess if neither of those two events happen in that time, they're not to run it longer than about 180 seconds worth. In other words, they're trying - they'd like to get a picture of the last drop there, Stu.

SC Okay. We'll change to one frame per second for at least 60 seconds or until no vent and max time will be 180 seconds.

CAPCOM Yes, That's it. Then the only thing else is you can frisk them when they get back and make sure they got your 18 millimeter lens and the mag F back across and they should put the 10 millimeter back on the LM camera.

SC Roger. I'm having Al sign a receipt for the command module property in here before he leaves.

CAPCOM Okay. And 14, we're going to have slight change over here directly. We may lose you for a minute or so.

SC Okay.

CAPCOM And 14, Houston. Radio check.

SC Loud and clear. How me?

CAPCOM Okay. I guess we've successfully did the switchover.

END OF TAPE

SC Houston, 14.

CAPCOM Go ahead, Stu.

SC Okay, Fred. I'd like to question you here since we've had this change in the flight plan, about going to the wide deadband here. If I do that, there'll be another maneuver back to start the PTC where if I stay narrow deadband I could be damping the rates when I got ready to start the PTC would you smoke that over there and see what you think about that.

CAPCOM Okay. Stand by, Stu.

END OF TAPE

SC Houston, 14.

CAPCOM Standby, 14, until we get a little better com line.

CAPCOM 14, Houston.

SC Go ahead, Houston.

CAPCOM Okay, Ed, I thought I heard you call a while ago.

SC Houston, do you read 14?

CAPCOM Okay, I'm reading you about 3 by 3, go ahead with your message.

SC Hello, Houston, do you read 14?

SC Houston, do you read 14?

CAPCOM 14, Houston.

SC Okay, Houston, we read you loud and clear.

CAPCOM Okay, we got good signal strength again.

SC (garble)

SC Okay, you're coming in now.

SC Okay, Fred, I didn't hear back from you and I wanted to get to the ROLL on this time around because it'll be too late the next one so I'm going to go ahead and go in the narrow deadband. It looks to me like we save gas that way.

CAPCOM Okay, he was still trying to crank out some numbers to compare there, Stu.

SC Fred-O, you've faded out again, we've lost you.

CAPCOM How do you read now?

CAPCOM 14, Houston. How do you read?

CAPCOM 14, Houston. We'd like OMNI ALPHA.

CAPCOM And Houston, 14, how do you read now?

SC Houston, this is 14. You're loud and clear.

CAPCOM Okay. The narrow dead band looks like it'll save you a little gas there, Stu.

SC Okay, I didn't hear back from you so I wanted to catch the ROLL this time around. So I went ahead and went narrow.

CAPCOM Okay.

SC Houston, I'm on the high-gain right now. How do you read?

CAPCOM Loud and clear, Ed.

SC How's your PCM?

CAPCOM Okay, they say it looks good.

SC Okay.

SC Houston, 14.

CAPCOM Go ahead, Ed.

SC At this high gain antenna setting - it'll not switch over to narrow dead band. Apparently it has as much signal strength and medium as I'm doing narrow.

CAPCOM Okay, we'll think about that.

CAPCOM Okay, 14, Houston. They'd like you to stay in narrow.

SC Roger. That's where I am.

SC Houston, 14.

CAPCOM Go ahead.

SC Roger. We're in the process of pressurizing the LM now as you can probably see. So we're holding for the integrity check at this point. I have the television set up and I'll turn it on at your command.

CAPCOM Okay, Ed. Standby on the TV; we'll see if their ready.

CAPCOM Okay, they're all set up, Ed, you can turn it on any time.

SC Hello, Houston, I'm transmitting.

END OF TAPE

CAPCOM Okay. We got the picture, Ed.

SC Roger, Houston. You should be able to recognize it. There's the commander's number 1 window. There's it's field of view at the moment. And Alan is up in the tunnel working the pressurization procedure. Stuart is coming up from under the commander's seat. You can see his head starting to come into the field of view now from stowing items down under the seat. Let's see if I can get a little better picture here for you.

CAPCOM Yes. Stu's head looks pretty good in color there.

SC You mean that color wheel can handle red, Fredo?

CAPCOM Yes. It seems to be doing a pretty good job there. I noticed some speckles on the window there. Is that - did yall end up with a little debris on there?

SC We have a few ice crystals apparently that have adhered to it from the various dumps we've made.

SC Yes, Fred. That window was clean as all get out till we started all the dumping.

SC Houston, we're continuing the pressurization procedure. We've just opened up the pressurization valve between the two spacecraft. And we're flowing into the LM from the command module. Give you a picture if you can see it here. There's cabin pressure gage, shows your quantity as well. Let's see if I can get that in view.

CAPCOM A little dark and out of focus there right now, Ed.

SC Yes. It's a little too close.

CAPCOM Yes. That's a little better, I can now see the - your little card there showing the antenna patterns, but the needles on the gage is a little hard to read.

SC We'll give up on that, Fredo. Our pressure is equal between the command module and the LM and we will start removing tunnel hardware at this point.

CAPCOM Okay.

SC Houston, we're starting to shoot up into the tunnel here. We're - Alan Shepard is starting to pull the hatch out. If I can get him to look down for a minute and say hello to the world.

CAPCOM Okay, Ed. I can see a form there that I guess is Al. It's - -

END OF TAPE

CAPCOM Okay, Ed, I can see a form there that I guess is Al. This pictures is just a little bit dark. You can see the lights up in the tunnel.

SC Rog, I think we'll have just a little bit more light on this hatch gets out of the way. We have all of our flood lights on full right now. While they're doing that, let's slide out to the CDR's window and take a look at the Moon which happens to right out the window. Going to coach me a little bit, Fred, as I approach this.

CAPCOM Okay, we can see it now as right down in the lower right quadrant of the window. The picture though we're seeing is accrepant and it's really not showing too much of the detail, Ed. Okay, you're zooming the camera now, Ed, and we lost the picture of the Moon.

SC Okay, let me try it again.

CAPCOM Okay, I think what happened when you zoomed, Ed, you ended up pointing above it.

SC Do you see anything now at all?

CAPCOM Okay, it just disappeared out the lower right corner. Now, we had it there for a little while.

SC Okay, how now?

CAPCOM Okay, there it barely came in the bottom portion of the picture now. Where abouts is the terminator now, is that about Tranquility, somewhere in there?

SC It's past Tranquility and I think it's - it's approaching 0 longitude at this point, I believe.

CAPCOM Okay.

SC A few hours ago we just passed delta Tegnia, Fred.

CAPCOM Yeah, right, Stu.

SC Rog, I was looking through the sextant there just a minute ago, all of the - around the (garbled) and the highlands showed up real well and terminator had just moved on over just passed the plain.

CAPCOM Okay, and for your information in the audience in the back here we have most of the family in tonight - this morning down here I should say.

SC Yeah, 3:15 is a good time of the night to have a TV show.

CAPCOM Prime time. Yeah, that's about right in the center of the picture now.

SC Okay, I've got full zoom on it, Fredo, and maybe it's too bright. Let's see if I can darken it, it'll improve the picture a little.

CAPCOM Yeah, you're right, it's so bright, Ed, we're - we had crescent but not too much detail on. Yeah, that's a little better.

SC And from our point of view, the Moon appears about the size of a grapefruit, held at arm's length

SC It's going to get considerbly bigger and I don't have the Earth to compare it with at the moment, but I suspect they are about the same size or maybe the Moon is starting to exceed the Earth in apparent size.

CAPCOM Okay, and the big board now has you at about ...

END OF TAPE

CAPCOM Okay. And the big board now has you at about a 180 000 out.

SC Roger. Okay. I'm going to come back inside. We have now stowed the hatch. And, Stu and I are up starting to break the probe out, and very soon will be able to make the trip into the LM with the camera and see what we can find in there.

SC We have not, as you can obviously see, rehearsed this. Our procedures are new to us, going into the LM for the first time, and, as a matter of fact, we were a little bit rushed getting the pressurization procedure complete in order to get in on time. We'll be ready here in about 2 minutes to move on into the LM, I think.

CAPCOM Okay.

SC And, now, let's go back inside the command module.

CAPCOM Okay. Are we looking up in the tunnel area now, Ed? It's pretty dark right now.

SC Yes, I'll be bringing the probe out ... it's dark, just one second, I'll see if I can improve the light situation for us.

CAPCOM Roger.

SC Okay. You're looking directly up inyo the tunnel now. The probe has been released from the drogue, and Stu is bringing it straight down through the tunnel.

CAPCOM Yes, we got that picture in pretty good, now. We can see it coming on down.

SC Okay, Houston. Al and Stu are taking the probe down under the right-hand couch now.

CAPCOM Roger, Ed.

CAPCOM We can see Al in the picture, now.

SC Okay, Houston. Probably clearer for you than it is on the monitor. It's a little dark in here.

SC You can look up the tunnel and see the drogue (garbled), Ed, and I'll go and pick it up for you.

SC Okay. You're looking directly up the drogue now which is gray in color and which has a hole in the center above the capture latch.

END OF TAPE

SC Okay, you're looking directly at the drogue now, which is gray in color and which has a hole in the center for the capture latches.

CAPCOM In our color pictures here, the opening in the drogue looks red in color. Like a big red eye.

SC Okay. And Alan has it out and he's starting to go down the tunnel with it, that's probably a little dark for you but he's coming down anyhow.

CAPCOM Okay, and we've temporarily, I hope, lost our picture down here, Ed.

SC Okay.

SC Fred, you have your picture back yet?

CAPCOM Negative, Ed.

CAPCOM And, 14, the problem with the loss of picture is on our end of the street.

SC Okay. Tell me when you have it back and we're ready to go through into the LM.

CAPCOM Okay.

SC And, Ed, Houston. You may continue the commentary I guess. It's being received out at the site and being recorded; we're just not getting it plumbed into here.

CAPCOM Okay. While we were just holding up here, Alan has slipped on through into the LM and is opening up the window shades and turning on the lights so as we go in we will have some lights to give you a little better picture. I'm waiting here to get your picture back before I start in, however, if you would like, I will go ahead and go into the LM.

CAPCOM Standby one, Ed.

CAPCOM Okay, Ed, they don't have an estimate right now. We might wait a couple of minutes and then I guess if we haven't got it back, you can proceed.

SC Okay.

SC Okay, Alan's coming back through the tunnel now and it will be clear here in a minute.

END OF TAPE

SC Houston, while we're waiting for your picture to come back and since it is being recorded in the site, we will take a quick station break and let Alan give us a commercial for Apollo 14.

CAPCOM Okay.

SC Okay. Apollo 14 is progressing very nicely. As you can see, we're now right on schedule. And it looks as though the first midcourse correction is going to put us in for the lunar orbit insertion burn. very close. We're currently preparing to go into the LM as Ed has told you and so far everything is working very well in the command module. We're very pleased with the way the systems are working. Everything is quiet, going along extremely smoothly and we have a happy little ship here. Everyone is well. Everyone is resting well. We're adapting to weightlessness, I think very rapidly. And everything is going along very smoothly at this point.

CAPCOM Roger, Al. And we have a picture back now. It's just a little bit on the dark side, but we can see you quite well.

SC Okay, Fredo. We'll start on in.

SC Okay. How's that?

CAPCOM Hey, that's a good picture, Ed.

SC (garbled) We're starting through the tunnel. The tunnel.

SC Why don't you show the docking light while you go by, Ed. See how they look on the television. Can you see the docking light, Fredo?

CAPCOM Roger. We can see those, Ed. We can see on down to the tunnel and the top of the ascent engine cover.

SC Okay. I think it's significant that in spite of our problem the other day, that when Stu finally got us into the docking ring that all of them snapped shut, which is very well lined up. And our docking index, as you know, cost us a case of beer, I think, because it's within one degree.

CAPCOM Okay. And you might let us know, Ed, how you find the trip through the tunnel there.

SC Okay. I'm sliding through.

SC Hey, was that question from Joe?

CAPCOM I'm not sure he'd own up to it.

SC Okay. I'm through the tunnel and I'm right at the top of the LM. I'm shining the - showing the camera down on the main console on the commander's side. How's that picture, Fredo?

CAPCOM Okay. That looks very good, Ed.

SC Let's see. I'll turn it around.

SC I'll go ahead and go on down and twist around and maybe we can look out the window.

SC Okay.

END OF TAPE

SC And, we're now inside the LM.

CAPCOM Thank you, Ed.

SC Can you see that, Fred.

CAPCOM Yes, we see what looks to be a patch, there Ed.

SC Is it good enough for you to read it?

CAPCOM It's something like beep-beep or ...

SC How did you ever guess? Must be some prompting from the ground.

CAPCOM Okay. And, Ed, a good portion of what you're swing here the picture is a little bit on the dark side. You might try opening it up just a little bit more.

SC Roger. I had it opened all the way, Fredo.

CAPCOM Well, I guess you can't do any better than that.

CAPCOM Did you find the LM pretty clean, Ed, when ya'll first came aboard or was anything loose in there.

SC No, both spacecrafts, Fredo, have been immaculate. I think we have found 1 washer floating along about 1 day ago, and we have seen nothing that was foreign to the spacecraft either before or since that time.

SC And, as I say that, I see one floating by me right now. It may be the same washer. I'd like to point out that Ed is talking about something external to the spacecraft. The cabin above the command module and the LM are extremely clean. We've been very pleased with the way they've looked.

CAPCOM Very good.

SC Yes, I think from what we heard along the line, we actually expected maybe to see a few more nuts and bolts. I think a lot of credit goes to checkout crew and everything because this spacecraft is really in good shape.

SC Fredo, I'm passing the camera back into Allen in the command module. We don't have really enough light in here to give you a good picture. And, there's not much help from the outside except the Sun is behind us right now.

CAPCOM Roger, Ed. We got a pretty good picture of you down in the tunnel right now.

SC Yeh, Fred. Did you hear that last comment I made about the crew and how clean the spacecraft was?

CAPCOM Roger, Stu.

SC That was planted, you know, for all the authorized people that worked on the spacecraft. You know, we're really inundated with unauthorized objects in both spacecrafts. I think Ed was showing you one up there, but if you could see this. I don't know if any of the backup crew is down in there tonight or not. Okay, how about about here. Is this enough. But, they've left their calling card.

CAPCOM Okay, we have a pretty good picture, of that, Stu. And, they are here.

SC Okay.

SC Tell them we sure appreciate every compartment that we open up having one of these come floating out of it.

CAPCOM They aim to please.

END OF TAPE

SC They aim to please.

SC Stu, you want to take the camera? Perhaps you can move it on up to the window. I don't know how much light there is but sure is a good shot of the moon out there. You might try again with the monitor so you can see what it looks like to them.

SC All right, I'll give it a go.

CAPCOM Okay, we can see the moon again in the number 1 window. It's down in the lower left corner now, Stu.

CAPCOM Okay, that's about right in the center.

CAPCOM Okay, that's - the picture's a little distorted now, Stu. It's a little bright.

SC Okay, that ought to help it a little.

CAPCOM Yeh, that's about right. It's still hard to see in this picture, much in the way of detail of the features, any features on the surface. Right at the terminator we can pick up a few craters but other than that it's really hard to see very much.

SC Okay. Yeh, I didn't think it was going to show up too much there, Fred, cause that's really the way it looks with the eye. It's just now, you know, starting to get into the area where the larger craters would show up.

CAPCOM Okay, we've got a good picture of Al there now.

SC Okay, he's got the transfer items that he's taking up into the LM for the activation and he might just give you a word on what they are.

SC The purpose of the excursion into the LM at this time is to check out some of the communications, do a little housekeeping, generally look the vehicle over and also in this particular (garble) the command module while we're there. This is done during the flight on the way to the moon to save time so that when we actually go into the LM for the final time prior to descent, there will be less things to do. So I have a package of things here in my hand which I'll now be taking up into the LM and will proceed on with the housekeeping tasks up there.

CAPCOM Okay, we can see him heading out with the package in hand there.

SC Okay, is there enough light up in there, Fred? You getting the picture?

CAPCOM Roger, Stu.

SC Okay.

CAPCOM Looks like running an obstacle course in the early going getting by all the hoses.

SC You got it.

END OF TAPE

SC And Fredo I'm starting back through the tunnel now to pick up the rest of the equipment. We have several 16 and 70 mm camera bags that are being transferred over. We'll pick those up and be right back with you.

CAPCOM Okay, Ed. Okay, I guess the picture I'm looking at now, as you're pointing back into the LEB and the area where the optics would be. And I can see the radiation meter back there.

SC Yeah, that's affirmative, Fred, I'm just really trying to get the camera out of the way there for a minute. Ed's got the other film magazine, he's headed back up into the LM now.

CAPCOM Yeah, Ed fits through there quite easily. I guess 0 g really does help.

SC I guess it does, no comment.

SC If you're commenting on what I think you're commenting on it was totally uncalled for, Fredo.

SC And Houston, we are both - Al and I are both in the LM now with all of the transfer items and we will procede to go ahead and give a check out as per the time light.

CAPCOM Roger, Ed.

SC Okay, Fred, I'll try to move up here and maybe we can look over the shoulder a little bit.

CAPCOM Okay, I can see a moving back and forth, I guess your head is down through now.

SC Okay, we're going to get a picture doll up here, Fred, I'm up by the LM hatch now trying to watch them work in the LM, but it doesn't look like it's going to be bright enough.

CAPCOM Yeah, it's pretty dark picture now, Stew.

SC Yeah, I'm afraid that's not going to show up. If we had a little light, I guess we need a little sun through the LM window.

sc Houston, I guess Stew and I'll have to give you a show from - Stew and I'll have to give you a show from that side. It's took dark over here.

END OF TAPE

SC Houston, I guess Fred and I will have to give you a show for - I mean Stu and I will have to give you a show from that side. It's too dark in here.

SC (garbled)

CAPCOM Okay. And you're cutting in and out there, Ed.

SC (garbled)

SC Okay. How now? Is that better.

CAPCOM Okay. You're loud and clear now.

SC Fred, this is Al. As you know we have the probe and drogue out. Is there anybody who's interested in taking a look at those or are you pretty well satisfied that just taking still pictures of it from here on out will do the trick.

CAPCOM Al, the word is the pictures should suffice. I - they're not particularly interested in another look right now.

SC Okay. Is there anything else you'd like to see before we sign out for the evening.

CAPCOM Okay, Ed - Al. The - I guess the answer is no to your last question.

SC Okay. In that case, we'll sign off. This is Apollo 14. We appreciate the opportunity to show you around the spacecraft and a little bit of the LM and I hope that next time you see the LM it'll have more light so you'll be able to see it better.

CAPCOM Thank you very much.

END OF TAPE

PAO This is Apollo Control at 61 hours 23 minutes ground elapsed time. That ends about 42 minutes of television time from Apollo 14. Beginning of the LM checkout, the checkout of the lunar module some of the housekeeping chores that the crew have to do for preparation for manning LM on landing day. The guests back in the viewing room for the TV transmission included Mrs. Louise Shepard, Mr. and Mrs. Alan B. Shepard, Sr., Al's parents. His daughter, Mrs. Laura Snider, a nephew, Bob Williams. Mrs. Shepard's mother, Mrs. Russell Brewer and a friend of Mrs. Shepard's, Mrs. Richard Abbott. Others in the viewing room were Mrs. Louise Mitchell, wife of the lunar module pilot, their daughters Carol, Collin, and Libby and Ed's mother Mrs. Ernest Wagoner. Stu Roosa's wife Joan, their childred Chris, Jack, Allen, and Rosemary.

SC Okay, Fred-O, do you want me to stay on the high gain here or go to OMNI CHARLIE?

CAPCOM They would like you to stay on high gain.

SC Okay.

CAPCOM Okay, and Stu, would you pass one word on down to Al and Ed.

SC Yeh, I can do that.

CAPCOM Okay, would you tell them to give us a call before they proceed on page 1 dash 15, where they're going to turn on the com and get a GO from us and make sure we've got good lock on the S-IVB.

SC Rog, Fred-O, I'm still on the com. I understand.

CAPCOM Okay, and I guess when you get there, Ed, just check with us and I'll make sure they're set up good on the IU before you press on.

SC Okay, Fred-O.

PAO This Apollo Control continuing with the roster of guests and parents who are in the viewing room during the television pass. Stu Roosa's parents, Mr. and Mrs. Dewey Roosa. Two of Stu Roosa's sisters, Mrs. Patty White, and Mrs. Gloria Sessums and a close family friend, Mr. Bob Perkins. The space digitals display now showing distance and velocity reference to the moon. Now showing 44 175 nautical miles out from the moon, velocity toward the moon 3 241 feet per second. At 61 hours 27 minutes ground elapsed time, still live on air-ground during the cchekout of the lunar module, this is Apollo Control.

CAPCOM 14, Houston. You still there.

SC That's affirmative, go ahead.

CAPCOM It's just pretty quiet, just wanted to see if you were still around.

SC That's affirm.

SC Houston, 14.

CAPCOM Go ahead, 14.

SC Okay, Fred-O, I guess sitting here looking, the next hour, we originally said we're going to go into PTC at 62:10, I don't know if that was before you came up with the waste water dump or not but we don't really want to start that before the waste water dump, do we?

CAPCOM That's right, Stu. The time, let's see I show on the flight plan change here is 63:10 established PTC, I'll recheck that, stand by.

SC Okay, you're right, Fredo, 63:10, okay.

CAPCOM Okay, Stu, but in any case you're right, not before the water dump.

SC Yeh, that was my mistake. I had marked that in before I'd moved everything up an hour and I've got it back over there in the right place and I did mark it off. Thank you.

CAPCOM And, 14, while we're talking about PTC, Stu, I'd like BD ROLL selected before you crank it up.

SC Okay, we use BD ROLL.

CAPCOM 14, Houston.

SC Go ahead.

CAPCOM You got any idea, Stu, where they are in the good book so we can maybe begin and be warned about the IU business?

SC Standby, I'll check.

SC Okay, they're finishing up 111, Fred-O.

CAPCOM Okay, 111.

END OF TAPE

SC Okay. Just a second here.

SC Okay, Houston. Apollo 14. We're switching to LM power at 62:21:14.

CAPCOM Roger, Ed.

SC Houston, the ED bus bat A is reading 37 volts, bat B 37 volts.

CAPCOM Roger. Both of them 37 volts, Ed.

SC That's affirm.

SC I need you to turn on your - -

CAPCOM 14, how do you read. Houston.

SC I read you 5 square, Fredo.

SC Hey, Fred, when you get a minute I need a vhf A check.

SC Okay.

CAPCOM Okay. And we'd like high taps on the LM.

SC Okay. High taps on the LM.

SC Okay. We're going to get them to them.

CAPCOM Okay. I guess we're reading Antares now loud and clear.

ANTARES Hello 14, Fred. This is Antares. Do you read? Answer.

KITTY HAWK Okay. And we're just about to start the water dump.

CAPCOM Too many of you are speaking at once there. Say again Antares.

ANTARES Okay. I was just giving you an estimated check for Antares.

CAPCOM Roger. Loud and clear and go ahead Kitty Hawk.

KITTY HAWK Disregard, Fred.

CAPCOM Okay.

ANTARES Okay. Your first one is 20 seconds and 24 frames a second and then 20 seconds of 1 frame per second. Then when you get near the end, when you're going to shut it off, you want 10 seconds of 24 frames per second and then one frame per second until it peter off.

CAPCOM That's correct, Ed. Except they didn't want to run it any longer than 180 seconds which is pretty close to three minutes.

ANTARES Yes. I've got it.

SC Do you see it. No, it's not there.

CAPCOM And Ed, or Antares, just a reminder. You're on SPA down noise backup now so you're upmike.

ANTARES Roger. Suspected that. Thank you. We're holding up, Fredo, in our procedures to allow finishing giving the waste water dump pictures.

CAPCOM Okay.

ANTARES Houston, from the LM this water dump looks like a snow storm.

CAPCOM Yes. That's how I figured it would look.

ANTARES Fred, were you getting your low bit rate. If so I'll switch you over to high.

CAPCOM Stand by one.

CAPCOM Okay. Okay, Ed. It looks good here. Low bit rate you can go to step 3.

ANTARES Roger. There is high bit rate.

CAPCOM Okay. We got high bit rate now, Ed.

ANTARES Roger. I'm going to step 4.

ANTARES Houston, how do you read Antares?

CAPCOM Gee, I read you loud and clear, Ed.

CAPCOM And Antares, Houston. We're ready for step 5.

ANTARES Roger. Houston, step 5. How do you read Antares?

END OF TAPE

SC Houston, how do you read us here.

CAPCOM Antarez, we're reading you loud and clear on low bit rate now.

SC Roger, standing by.

CAPCOM Anterez, Houston, we're ready for step 6 now.

SC Roger.

CAPCOM Anterez, Houston, how do you read?

SC Okay, Fred, loud and clear, how's me?

CAPCOM Okay, it's not bad at all, I'd say you're loud and clear also.

SC Roger.

CAPCOM Anterez, Houston. We're ready for sub 7 now.

SC Houston, how do you read Anterez?

CAPCOM Okay, Anterez, Houston, read you loud and clear.

ANTEREZ Roger, Houston. Kitty Hawk, Anterez, how do you read?

KITTY HAWK Ed, how do you read on A.

ANTEREZ Loud and clear, Stew.

CAPCOM Anterez, Houston. We're ready for step 8 now.

ANTEREZ Fredo, (garble) stand by one.

ANTEREZ Kitty Hawk, Anterez, how do you read (garble) eight now?

ANTEREZ Houston, Anterez, how do you read?

CAPCOM Anterez, Houston, read you loud and clear.

ANTEREZ Okay, I guess I'm ready for step 8 now.

CAPCOM Okay, you're go for step 8.

ANTEREX Okay, now. How do you read, now?

CAPCOM Read you loud and clear, Ed. Okay, Ed, everything looks good down here.

ANTEREZ Okay, stand by on- we're still having trouble getting our VHF turned on.

CAPCOM Roger.

KITTY HAWK Gas B assembly.

ANTEREZ Okay, (garble).

ANTEREZ Kitty Hawk, Anterez, how do you read me Kitty Hawk. Kitty Hawk, Anterez, (kay (garble) how do you read VHF, please? Kitty Hawk, Anterez, how do you read, now?

CAPCOM Anterez, Houston. We'd like a readout on bat 5 and 6 voltage.

ANTEREZ Stand by, Houston.

CAPCOM Kitty Hawk, Houston, we're ready to dispense with the water dump, now.

KITTY HAWK I've already shut it off, Fredo.

r

KITTY HAWK It's coming back up now.
CAPCOM Okay.
ANTARES Kitty Hawk, Antares, read you loud and clear.
KITTY HAWK Okay, you're 5 square let's try A.
ANTARES Okay.
KITTY HAWK How do you read on A, Ed?
ANTARES Kitty Hawk, Antares, read you loud and clear on A, how's me?
KITTY HAWK You're Fine.
ANTARES Okay, we took out didn't we?
ANTARES Houston, Antares, BATS 5 and 6 are reading 36 and a half at 37 volts respectively.
CAPCOM Okay, copied it, Antares.

END OF TAPE

CAPCOM Okay, Ed. Can I turn ... do you want me to turn the VHF off.

SC Houston, Antares.

CAPCOM Go ahead, Antares.

SC We're going to skip the OPS checkout till Al gets through with his camera work, and I'm going to go ahead with the power deactivation. We'll pick the checkup out shortly.

CAPCOM Okay, that'll be alright.

SC Okay, Antares is going off the air for a couple of days.

CAPCOM Kittyhawk, Houston.

SC Go ahead, Houston.

CAPCOM Is Ed still downstairs?

SC Yes, they're both down there.

CAPCOM Okay.

SC We just transferred to ... we just transferred to command module, Paul, be coming back up in a minute.

CAPCOM Roger, Antares. I got a question there. I was wondering if Ed recalls back on step 1 on COM activation if he had to switch the antenna, S-band antenna switch, was it already in aft or did he move it to forward and back to aft.

SC Okay. Stand by.

SC Okay, this is Antares talking to you on (garbled) we found the S-band antenna in aft as the checklist called for and he did not move it for step 1.

CAPCOM Alright.

PAO This is Apollo Control at 63 hours 8 minutes ground elapsed time. Presently crew of Apollo 14, two of them that is, enroute back to the command module if indeed they are not already in with the tunnel closed. Change of shift hand-over taking place in the control room now where Pete Franks' Orange Team is taking over from the Gold Team headed up by Flight Director Jerry Griffin. We will have the change of shift press conference in the Houston news center within the next half hour or so. Participant being said Jerry Griffin. And, at 63 hours 9 minutes ground elapsed time, this is Apollo Control.

CAPCOM Antares, Houston.

SC Okay, this is Antares. Go ahead.

CAPCOM Okay, Al, are you back in the Kittyhawk now?

SC No, I'm still in Antares, but I'm using Kittyhawk cable.

CAPCOM Roger. The question is we've got you back on Antares back on command module par and they're showing 2 amps high. And, the question is has the reconfiguration been complete as per the initial activation status chart for

CAPCOM circuit breakers are back on 13 and 14 yet.

SC That's affirmative per checklist.

CAPCOM Okay.

SC Houston, Antares.

CAPCOM Go ahead, Antares.

SC The OPS checkup complete. The source pressure on the CDR reading 62000, lowest pressure on LMP reading 6000.

CAPCOM Okay. Copy now. CDR 6200, LMP 6000.

PAO That's Al Shepard talking to Fred Hayes out here in Mission Control. Meanwhile in Mission Control, we're pressing on with our handover between shifts. The Orange Team coming in now to replace the Gold Team. We're at 63 hours 15 minutes into the flight. We presently show Apollo 14 traveling at a speed of 2500 to 54 feet per second. And, at a distance away from Earth of 179 900 nautical miles. Continuing to monitor this is Apollo Control, Houston.

SC Houston, Antares.

CAPCOM Go ahead, Antares.

SC We rechecked our circuit breaker on configuration, and we found that EPS dc bus volts panel 11 was out. It is now in.

CAPCOM Roger.

CAPCOM Antares, Houston. Over.

SC Go ahead, Houston.

CAPCOM I was just looking through the checklist. On page 1-18 under the 64 hour call out it shows that EPS dc bus volt circuit breaker back open. It comes after you check the circuit breaker charge up at the top of the page. So I guess that dc volt should be open.

SC Okay, stand by one.

PAO This is Apollo Control, Houston. Gordon Fullerton now on the Capcom position replacing Fred Hayes. That was Fullerton speaking just now to Commander Al Shepard. We're 63 hours 26 minutes, Apollo 14 180 184 nautical miles away from the Earth. And, traveling at a speed of 2546 feet per second. This is Apollo Control, Houston.

END OF TAPE

SC Houston, Antares.

CAPCOM Go ahead, Antares.

SC Okay, I think our checklist is finally in phase with your checklist and the dc BUS VOLT circuit breaker panel 11 is OUT.

SC Roger, Al.

PAO This is Apollo Control, Houston. 63 hours 29 minutes. Participants for the change of shift news conference are presently en route. We anticipate the conference to start in approximately 10 minutes.

CAPCOM Apollo 14, Houston.

SC Go ahead.

CAPCOM That current in the LM seems to be dropping down. It's down to about an amp now. It's looking pretty normal. So we don't think any more effort trying to find out the cause of it is worthwhile. Over.

SC Okay. As I say I think we're finally in phase now. We - the last item we did was turn out the flood lights which probably helps the situation. The LM hatch is now closed and both Ed and I are clear of it.

CAPCOM Roger.

CAPCOM Apollo 14, Houston.

SC Go ahead.

CAPCOM Roger. If it's convenient to get to, we'd like to know how much of that magazine fox trot you used taking pictures of the water dump.

SC Okay, we used one third of the magazine.

CAPCOM Roger, Stu, one third.

PAO Apollo Control, Houston. 63 hours 37 minutes now into the flight. Al Shepard, Ed Mitchell back in the Kittyhawk now. Presumably closing out the LM hatch and at some point, installing the probe and drogue and command module hatch. We show Apollo 14 at 180 438 nautical miles and traveling at a speed of 2 540 feet per second. At 63 hours 37 minutes into the flight, this is Apollo Control, Houston.

PAO This is Apollo Control, Houston at 63 hours 39 minutes ground elapsed time. The change of shift news conference is scheduled to start momentarily and at this point we will take down the line and tape any conversations which might transpire. This is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control, Houston, at 63 hours 59 minutes ground elapsed time. We presently show Apollo 14 at the distance of 180 983 nautical miles away from Earth, traveling at a speed of 2526 feet per second. Capcom Gordon Fullerton has had limited conversation with Apollo 14 since we had taken the line down for the change of shift conference. We will play that conversation back to you now.

SC Houston, 14

CAPCOM 14, Houston. Go ahead.

SC Okay, Gordon, I guess you're going to give me a call when it's okay for PTC, huh?

CAPCOM That's right. Down a little we'll take a look and see how your rates look.

CAPCOM Apollo 14, Houston. You look good now, you're clear to spin it up.

SC Okay, thank you.

CAPCOM Also, we'd like omni bravo and you're clear to secure the high gain antenna.

SC Roger, Bravo.

PAO Apollo Control. As you heard Capcom Fullerton talking both to Stu Roosa and Ed Mitchell. Apollo 14 has now returned to its slow rotation, the passive thermal control of the spacecraft, and of the high gain antenna has been secured. We're 64 hours 1 minute into the flight. Back up live. This is Apollo Control, Houston.

END OF TAPE

CAPCOM Apollo 14, Houston. Over.

SC Go ahead, Houston.

CAPCOM Roger. We're watching the PTC and it doesn't look too good. It's heading right on out of the box. We lost data just as you started to spinup with that antenna switchover. It was poor timing on our part. So we're not sure just how the start went, but we're sure this one isn't going to work. So at your convenience if you'll restart another - or redamp the rates and stand by for our GO for another startup. Over.

PAO Apollo Control, Houston. 64 hours 15 minutes ground elapsed time. Gordon Fullerton advising Ed Mitchell to - that it's our consideration to reestablish the passive thermal control mode.

CAPCOM 14, Houston.

SC Go ahead.

CAPCOM If you stop near a roll angle of either zero or 180 that will gives us better high bit rate to watch your rate.

SC Okay. Stu's coming up to the top now.

CAPCOM Roger.

PAO 64 hours 16 minutes ground elapsed time. 14 now 181 390 nautical miles away from earth. Presently travelling at a velocity of 2516 feet per second. This is Apollo Control, Houston.

SC Okay, Gordon. I'm up here, that one didn't take, huh?

CAPCOM No. It just headed right on out to the limit for some reason, Stu.

SC Okay, Gordon. How do you read?

CAPCOM About squared, Stu. Go ahead.

SC Okay. So that one didn't take, huh?

CAPCOM Negative. It went right straight on out toward the limit on our plot here. We didn't get a good readout on the initiation of it because we had that antenna switchover right at the time. I'll stand by till we get through this - into the next OMNI here.

SC Okay.

CAPCOM Stu, this is Houston. How do you read now?

SC You're loud and clear.

CAPCOM Okay. I mentioned to Ed if you'll stop the roll on near zero or near 180 we'll have good antenna angle for high bit rate and can watch the rate that way.

SC Okay.

END OF TAPE

PAO This is Apollo Control Houston at 64 hours 48 minutes GET. We presently show Apollo 14 at a distance of 182 151 nautical miles out from earth, and travelling at a speed of 2496 feet per second. The crew of Apollo 14 presumably eating at the present time, they will establish the passive thermal control - or re-establish the passive thermal control following this morning's meal. We're at 64 hours 48 minutes GET, this is Apollo Control Houston.

MADRID Madrid, contact on that one.

CAPCOM Roger, Madrid, Houston contact. How do you read me?

MADRID Roger, I read you fiver.

CAPCOM Roger, you can go normal, thank you.

END OF TAPE

PAO This is Apollo Control, Houston, 65 hours and 30 minutes ground elapsed time. We now show Apollo 14 at a distance of 182 520 nautical miles traveling at a speed of 2487 feet per second. We'll continue to monitor for any conversation as it should come up between CAPCOM Gordon Fullerton here in Mission Control and members of the Apollo 14 crew. This is Apollo Control, Houston.

CAPCOM Apollo 14, Houston. Over.

SC Go ahead, Houston. 14.

CAPCOM Roger. As you're sitting there, your high gain is pretty well pointed at us. We'd like to bring it up to watch the start of your next attempt at PTC. Would you go to AUTO on our select high gain?

SC Okay, Gordon, it looks like we've got the high gain.

CAPCOM Roger. We have it.

PAO That's Stu Roosa aboard Apollo 14 talking to CAPCOM Gordon Fullerton.

CAPCOM Apollo 14, Houston. You have a GO to start this one up.

SC Okay, thank you.

PAO Apollo Control, Houston, 65 hours 08 minutes ground elapsed time. Apollo 14 182 644 nautical miles away from earth presently traveling at a speed of 2484 feet per second. That was Gordon Fullerton giving a GO for restart of the passive thermal control.

CAPCOM 14, Houston.

SC Go ahead.

CAPCOM It looks to us like you might have missed one jet enabled delta 2 to have it well coupled.

SC Rog. Thank you, Gordon.

CAPCOM 14, Houston, your rates are still good if you want to give her a start.

SC Okay, Thank you.

CAPCOM Apollo 14, Houston. Over.

SC Go ahead, Houston.

CAPCOM We show on the 02 slow-up a little bit to eight-tenths and suggest that you might look around at the - all the overboard drains, valves and make sure they're tightly secured. Over.

SC Okay. Thank you.

SC (Humming). Ready.

END OF TAPE

CAPCOM Apollo 14, Houston. Give us OMNI Bravo, and your clear to secure the high gain antenna.

SC Okay.

CAPCOM Apollo 14, Houston, over.

SC Go ahead.

CAPCOM We see that the cabin pressure which was down to near 5, it is back up to 5.1 and the flow rate is decreasing now. Does this help you, give you any clues as to what the problem might have been? Did you find any loose valves, over?

SC Not as yet. We're having problems with a sticky myrtle. We're working on that problem now.

CAPCOM Roger, out.

PAO Apollo Control Houston, 65 hours 24 minutes GET time. We presently show 14 at a distance of 183 025 nautical miles away from earth and traveling at a velocity of 2475 feet per second.

END OF TAPE

CAPCOM Apollo 14, Houston. Over.

SC We're here. Go ahead, Houston.

CAPCOM Roger. I have a short shopping list of items for you here. First of all, the state vector onboard there is of good shape and no update will be required as scheduled at 66 hours.

SC Okay.

CAPCOM And it's looking like midcourse 4 will be about 3.5feet per second - 3-1/2 feet per second. And one question on the lens - the 18 millimeter lens that you took over to use to take the pictures of the water dump. It's you job to take of where things are, did you bring that back and restow it in the command module? Over.

SC That's affirmative, Gordon. The lens is back and stowed in the command module and understand midcourse 4 will be about 3.2.

CAPCOM Stu that's 3.5, but that's close enough as close as we can tell come now. The PTC is what can get us hanging in there and well maybe it's too early to predict. It looks like it's going to take this time. There is an 02 heater reconfiguration shown at 65.10 in the flight plan to do and the presleep items on the checklist and that's all we have before you retire for the day. Over.

SC Okay. We just, about 10 minutes ago, configured the heaters and we're going to press into the presleep period momentarily.

CAPCOM Roger.

PAO This is Apollo Control, Houston. 65 hours, 43 minutes into the flight. That was CAPCOM, Gordon Fullerton, talking to Command Module Pilot Stu Roosa. The report he made indicated that no alinement of the platform would be required before the start of the rest period. Also the plots of the passive thermal control mode as displayed on the guidance and control officers console here at Mission Control appear very favorable. Midcourse correction 4, flight dynamics advises presently looks like a 3.5 foot per second burn. This is presently scheduled at a ground elapsed time of 77 hours, 38 minutes and we now show Apollo 14 at a distance of 183,490 nautical miles, traveling at a velocity of 2463 feet per second. We're at 65 hours, 44 minutes ground elapsed time and this is Apollo Control, Houston.

END OF TAPE

SP $
.06 sec

APOLLO 14 MISSION COMMENTARY,2/3/71,0809 CST,65:46 GET,MC-211/1

PAO This is Apollo Control Houston at 65 hours 55 minutes GET. Apollo 14 now at a distance of 183 764 nautical miles away from the earth. Velocity now showing 2456 feet per second. The crew of Apollo 14 just about ready to start their rest period, we may - or may not - have further contact with them. We will standby and continue to monitor in the eventuality we do have contact with the crew prior to the start of their rest. We're at 65 hours 56 minutes GET and this is Apollo Control Houston.

END OF TAPE

SC Houston, Apollo 14.

CAPCOM Apollo 14, Houston. Were you calling. You are very weak.

SC That's affirmative, Gordon. I'm ready for an E memory dump. Do you think it's been dumped?

CAPCOM I'm reading you just barely, Stu. Stand by a second till we can take you in MOD and this kind of antenna configuration.

CAPCOM Stu, we're going to have to wait a couple of minutes until a better antenna gets up.

SC Okay.

CAPCOM Apollo 14, Houston. We are ready at this time for the E COMM. Over.

SC Okay, Houston, here it comes. And Gordon, I've got some onboard readouts when you're ready.

CAPCOM Okay, go ahead.

SC Okay, battery C - 37.0, Pyro battery A, 37.4, Pyro Battery B, 37.4, RCS: Able, 87, Baker 87, Charlie 85, Delta 86.

CAPCOM Roger, Stu, we copied all those.

SC And, Gordon, for a prestatus, we're all in good shape and no medication.

CAPCOM Roger, Stu.

PAO Apollo Control, Houston, 66 hours 03 minutes ground elapsed time. We presently show Apollo 14 at an altitude of 183 948 nautical miles away from earth, presently traveling at 2452 feet per second.

CAPCOM 14, Houston.

SC Go ahead, Houston.

CAPCOM Looks like we've got the dump complete, and one question for the E COMM, with this data configuration right now, you can't really tell if you have cycled all the cryo fans, we just wanted the confirmation that you had. Over.

SC That's affirmative. The fans were cycled.

CAPCOM Okay, thank you.

PAO Apollo Control, Houston, 66 hours 06 minutes. Following that conversation between CAPCOM Gordon Fullerton and command module pilot, Stu Roosa, we expect the crew to start their rest period, the E-memory dump completed, then this should close out our contact with the crew. We now show Apollo 14 at 184 033 nautical miles away from earth and traveling at a speed of 2450 feet per second. This is Apollo Control, Houston.

END OF TAPE

SC Houston, 14 signing off for the evening.

CAPCOM Roger. Al, pleasant dreams to you all.

SC Thank you.

PAO Apollo Control Houston. That was space craft commander Al Shepard advising the mission control in Houston that the crew of Apollo 14 was ready to get some sleep. We now show Apollo 14 at 184 292 nautical miles out from earth. Velocity now reads 2443 feet per second. GET time presently at 66 hours 18 minutes. This is Apollo Control Houston.

END OF TAPE

APOLLO 14 MISSION COMMENTARY, 2-3-71, 0841 CST, 66:18 GET, MC-214

PAO This is Apollo Control, Houston, at 66 hours, 35 minutes now into the flight. Our displays in mission control show Apollo 14 at a distance of 184,700 nautical miles away from the Earth. Traveling at a velocity of 2433 feet per second. Since the crew of Apollo 14 has begun the flight plan sleep period we will bring down the line at this time and pick up again if any conversation should transpire. We're at 66 hours, 36 minutes ground elapsed time and this is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control Houston at 66 - 67 hours 7 minutes GET. We expect Cap Com Gordon Fullerton will place a call to the spacecraft. Here we're showing a high 02 flow rate. Apparently, most probably caused by a leak of one of the over board vents. If this call is placed, Fullerton will ask one of the crew members to - to check all the valves on board. There's some consideration that they might not be seated properly. The passive thermal control mode however still remains stable. We'll standby and continue to monitor in the event that call is placed, the line is now up live. Since Apollo 14 has passed through lunar sphere influence at 66 hours 49 minutes 4 seconds, our displays in Mission Control are now referenced to the moon. We show Apollo 14 now presently 33 202 nautical miles away from the moon, and traveling at a speed of 3306 feet per second, relative to the moon. We'll standby and see if the call is placed to Apollo 14.

CAPCOM We also notice a - that the main reg is open as a result and 02 flow has been steadily increasing, last time we had high bit rate was about four tenths of a pound per hour. The PTC is being disturbed but it still is stable, we wanted to alert you to try accomplishing this leak, before we throw the PTC out of balance. What we'd like you to do is check all the over board drainage valves, one at a time. This time we would like to try to tie down precisely which - which valve is the guilty one and would like - as you either tighten up or jiggle them or whatever you think of to do to the valves, do each one individually and give us time to watch the flow rate and see if we can tie down. Over.

SC Okay, start away.

PAO That's Ed Mitchell responding to that call.

SC Houston, the waste management dump valve is going to off at this point.

CAPCOM Roger.

SC Houston, Apollo 14.

CAPCOM Apollo 14, Houston. Go ahead.

SC Gordon, did you notice a step increase of the flow rate, or has it just been a gradually increasing thing over the last hour or so?

CAPCOM It's been a gradual increase, however, just - we've been watching the data after you told us you closed the waste management overboard drain and we're seeing it drop down. That may be the culprit right there. Can you verify the configuration that you were in, did you have the cap on the myrtle, was the cap closed? And was the waste management overboard drain open? Prior to our waking you up? Over.

SC Well, the waste management drainage (garbled)

PAO This is Apollo Control Houston, we will standby while we're having a switching of antennas.

CAPCOM Apollo 14, Houston. Over.

CAPCOM Apollo 14, Houston. Over.

SC Houston. 14. Go ahead.

CAPCOM Okay Ed, we missed your answer to my question completely, I'll turn the OMNI switch over to out, over.

SC Roger, your last question about the configuration of the waste management drain to the myrtle?

CAPCOM That's affirmative, that question.

SC Okay, roger. The myrtle - the waste management system had been in use several times for the last hour and if you saw changes probably fluctuating up and down, it was undoubtedly due that system.

CAPCOM I see, you used it several times.

SC That's affirmative.

CAPCOM That's - that's since you signed out for the night, that right?

SC That's affirmative. Right now the drain is closed, and it has been closed, re-opened and closed at least twice since we signed off for the night.

CAPCOM Roger.

END OF TAPE

CAPCOM Apollo 14, Houston.

SC Go ahead.

CAPCOM The 02 flow is drop back down now. Its not come down, that is it still appears that the main rate that may be flowing a little bit. What we suggested that you use the direct 02 to pump the cabin back up to 5.7 and then go on back to sleep and we'll try not to bother you. The PTC looks like it should hold okay (GARBLE)

SC Okay Gordon. That's fine.

PAO Apollo Control Houston. 67 hours 21 minutes GET time. You heard that last conversation between CAPCOM Gordon Fullerton and lunar module pilot Ed Mitchell. It would appear that the use of the waste management system may have been the culprit in this case. We now show Apollo 14 at 32 766 nautical miles away from the moon and traveling at a speed of 3309 feet per second. That speed relitive to the moon. This is Apollo Control Houston.

END OF TAPE

SC Houston, this is Al.

CAPCOM Apollo 14, Houston. Go ahead.

SC Apollo, Houston this is Al.

CAPCOM Roger Al, we read you weak. Go ahead.

SC Houston, 14.

CAPCOM Ed this is Houston. Go ahead.

SC Hello Houston, Apollo 14.

CAPCOM Apollo 14, Houston. Loud and clear now, go ahead.

CAPCOM Apollo 14.

SC This is Apollo 14 do you read?

CAPCOM Roger, Apollo 14, this is Houston you're loud and clear. Go ahead.

SC Okay. Two items, first of all, Al's got a sensor replaced, do you want the medic to take a look at it and pump the cabin up, shutoff the direct O2 and that flow is down to two tenths now.

CAPCOM Roger. Okay, advise them that we're still in low bit rate and there will be a few minutes or a few seconds here before we can get high bit rate. 14, Houston, we're going to have to wait until we rotate around to it and an antenna angle that we can get high bit rate before we can check that sensor but we'll give you a call in a minute or two when we're ready.

SC Okay.

CAPCOM Apollo 14, Houston. CDR's biomed data looks very good according to Dr. Berry himself.

SC Okay. I just changed the paste in a sensor and put a new sticky washer on the electrode weighter then.

CAPCOM Okay then they're willing to sign you up. For a permanent job at doing that. If you would like to after the flight.

SC Well, we'll discuss it.

SC Houston, 14 if you're satisfied then, I'll return my COMM configuration to the sleep configuration.

CAPCOM Okay. Let me make one quick check here. Yes, I guess that's all we've got. We'll say goodnight once again.

SC Thank you, Gordon.

PAO 67 hours, 30 minutes ground elapsed time. This is Apollo Control, Houston. We show Apollo 14 at 32,470 nautical miles away from the moon and now traveling at a speed of 3311 feet per second relative to the moon.

END OF TAPE

APOLLO 14 MISSION COMMENTARY, 2-3-71, 0947 CST 6737 GET, 218/1

PAO This is Apollo Control, Houston, at 68 hours 04 minutes into the flight - ground elapsed time. We presently show Apollo 14 at a distance of 31 392 nautical miles away from the moon and traveling at a speed of 3321 feet per second relative to the moon. We've had no further conversation with the crew of Apollo 14 since they were awakened by CAPCOM Gordon Fullerton to check a high 02 flow rate. Presumably the crew, if not yet sleeping, shortly will be. We're at 68 hours 05 minutes into the flight and this is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control, Houston. At 63 hours, 33 minutes now into the flight of Apollo 14. We presently show Apollo 14 at a distance of 30,431 nautical miles away from the moon, now traveling at a velocity of 3329 feet per second. We've had no communications with the crew. Since our last report, the crew now in its rest period - they are in their rest period. Meanwhile, activity in Mission Control has been conversations over the flight directors loop have been quite subdued. It's been mainly a scene where flight controllers are studying their displays, they are considering the activities that will lie ahead on the next shift. A test of one of the lunar modular batteries by spacecraft Commander, Al Shepard, and Ed Mitchell is being considered either at the time of LM activation or before. Ascent battery number 5 has shown a reading of 3 tenths of a volt low on the open circuit voltage. If the test is run, it would involve putting the LM battery number 5, the one under question, on one of the busses for an independent or second reading off another transducer and provide a second data point. The present reading is taken from the battery transducer without any load. If the second reading indicates a shift in signal conditioner then it would indicate faulty instrumentation rather than a fault of the battery itself. We will stand by and continue to monitor this possibility and provide updates as they become available. We're at 68 hours, 35 minutes ground elapsed time and this is Apollo Control, Houston.

END OF TAPE

APOLLO 14 MISSION COMMENTARY, 2-3-71, 1059 CST 6836 GET, 220/1

PAO This is Apollo Control, Houston, at 69 hours and 09 minutes now into the flight of Apollo 14. We presently show Apollo 14 at a distance of 29 256 nautical miles away from the moon traveling at a velocity of 3340 feet per second. We've had no communication with the crew of Apollo 14 since our last report. Our clock at Mission Control shows a projected wake-up time of 5 hours and 50 minutes from this time. At this time, we will take down the release line and bring it back should we have contact with the crew, which is not presently anticipated. At 69 hours 10 minutes ground elapsed time, this is Apollo Control, Houston.

END OF TAPE

APOLLO 14 MISSION COMMENTARY,2/3/71,1210 CST,69:47 GET,MC-221/1

PAO This is Apollo Control Houston at 69 hours 47 minutes now in the flight of Apollo 14. We presently show the Apollo 14 spacecraft at a distance of 27 999 nautical miles away from the moon. And travelling at a speed of 3353 feet per second. We've had no contact with the crew now well into their rest period since our last report. However, in Mission Control, Flight Director, Pete Frank, has been holding discussions with Mr. Sig Schuberg, Director of Flight Operations and Mission Director, Chet Lee and other , about the LM battery test being considered. This - a test on LM battery number five which had shown a low readout during the LM house-keeping activities early this morning. Battery number five voltage reading, both on the ground and through - crew readout read 36.7 volts, the normal reading is 37 volts. The proposed test would aid in determing if this in fact is a fault of the battery or an instrumentation or sensor problem. It has not yet been decided when the test may be held either at LM activation or before. We're at 69 hours 49 minutes GET, and we will shortly be undergoing a shift hand over in Mission Control, and a change of shift news conference will be held between the hours of 12:30 and one o'clock. This is Apollo Control Houston.

END OF TAPE

APOLLO 14 MISSION COMMENTARY 2/3/71 70:21 GET MC-222/1

PAO This is Apollo Control at 70 hours 22 minutes. The crew still has a little over 4 and a half hours remaining in this rest period. At the present time we are in the process of completing the shift hand over. Flight director Milton Windler getting briefed by the off going flight director Pete Frank. Windler will shortly be going around the room and checking on the mission status with each of his flight controllers reviewing the status of the mission. At this point, a change of shift news briefing is scheduled to occur in the main auditorium of building 1. As soon as the shift hand over is completed, our best estimate on that at the present time would be about 15 minutes. At 1:30 a Sky Lab Briefing is scheduled. That briefing if the news conference runs long will follow immediately after the change of shift news conference. And it will also be held in the main auditorium of building 1. At the present time we show Apollo 14 traveling at a velocity of 3366 feet per second and 26 819 nautical miles from the moon. At 70 hours 23 minutes, this is Apollo Control Houston.

END OF TAPE

PAO This is Apllo Control at 73 hours 12 minutes. We're still considering the possibility of having the crew reenter the lunar module, following their sleep period to run a test on the ascent battery, which is showing, at last check a slightly below normal open circuit voltage. No decision has been made at this time as to whether or not that will be done ahead of the flight plan. If it is decided to run the check, it would most likely be performed following the midcourse correction 4 and before the lunar orbit insertion. The midcourse correction 4 is currently scheduled at 77 hours 38 minutes. The manuever will be performed at this time, anyway, with the SPS, the Service Propulsion System engine. The current velocity change required appears to be about 3.6 feet per second. That could be performed with the service propulsion system using a minimum impulse burn of about .6 of a second. The crew has a little bit more then 1 hour 45 minutes remaining in their rest period. We plan to let them sleep the full time if they so desire. Flight Director Milton Windler checked with the Flight Activities Officer a short while ago to see if it would be possible to extend the sleep period if the crew is still sleeping at the end of the period, and the Flight Activities Officer replied that it would be possible to extend it by as much as about 30 minutes and still not run into any problems getting the midcourse correction performed on time. We have a video tape of last nights television of the lunar module housekeeping, which we prepared to replay at this time. The video replay will be in black and white, in order to minimize wear on the tapeheads of the color converter, and we'll play that video tape back at this time.

END OF TAPE

PAO This is Apollo Control at 74 hours 12 minutes. We now have about 47 minutes remaining in the crew rest period. Around the Flight Directors console, for the past 45 minutes or so, there have been a series of group discussions on the procedures that are being worked out for checking out the LM ascent battery. Flight Director Milton Windler advised the Flight Controllers of the progress of the descussions a short while ago. He said at this time, we still do not have a decision as to whether or not we'll attempt to get into the LM and check out the battery, although he said, we do appear to be moving in that direction. If the crew is advised to enter the LM and run the test on the LM battery, it would be done after midcourse correction 4 which is scheduled to occur at about 77 hours 38 minutes. We would like to have the crew completed with activities in the lunar module and back in the command module by about 80 hours to allow adequate time for the lunar orbit insertion maneuver, which is scheduled to occur at about 82 hours 38 minutes. At the present time we show Apollo 14 traveling at a velocity of 3487 feet per second. Now 19068 nautical miles from the moon. At 74 hours 14 minutes, this is Apollo Control Houston

END OF TAPE

PAO This is Apollo Control at 74 hours, 52 minutes. The Apollo 14 crew is scheduled to end its rest period in about 10 - about 8 minutes from this time. We are prepared to let the crew sleep an additional 30 minutes if they so desire. When the crew is awake we plan to discuss with them procedures for checking out battery 5 in the LM ascent stage and if the crew concurs we will have them re-enter the Lunar Module at about 78 hours to run the test on battery 5. Essentially the way the test is planned is to have the battery 5, which is hooked to the Lunar Module pilots bus in the LM, remove from that bus and attach to the commanders bus where the open circuit voltage can be measured with another sensor. If the sensor on that bus again measures the slight decrease in voltage that was shown on the Lunar Module Pilot bus, that is about 36.7 volts as opposed to 37 volts, the battery will be - the reading will be verified by putting the battery 6 back on the Commanders bus and comparing the reading on that battery and if in fact a difference does exist between the two batteries and battery 5 continues to show a lower reading, it will be tested under LOAD and by putting some equipment on line and we'll be watching to see if the batteries share the load equally and if battery 5 is able to maintain full output or able to hold up to 2 amps of load - under load. This procedure will be discussed with the crew and others and if the crew concurs, the IVT into the LM, the intravehicular transfer to the LM will occur at about 78 hours. At the present time we show Apollo 14 17,671 nautical miles from the moon. The spacecraft velocity is 3,518 feet per second. We'll continue to stand by live from this point on for word from the crew that they are up or in the event that we don't hear from them in 5 minutes or so when they are scheduled to awake in about 30 minutes when the CAPCOM would put in a call. At 74 hours, 56 minutes - 55 minutes, this is Apollo Control Houston, standing by.

END OF TAPE

PAO This is Apollo Control at 75 hours, 30 minutes. We're nearing the end now of the 30 minute extention to the crew's sleep period and we expect that CAPCOM, Bruce McCandless will be putting in a call shortly to the crew. At the present time Apollo 14 is 16,433 nautical miles from the moon. The spacecraft velocity has increased now to 3,549 feet per second.

PAO Our communications engineer reports that we're getting carrier downlink from the spacecraft indicating that the crew is up and about and preparing to give us a call. So we'll continue to stand by for that.

END OF TAPE

CAPCOM Apollo 14, Apollo 14, this is Houston. Over.

CAPCOM Apollo 14, Apollo 14, this is Houston. Over.

SC Alright, Houston. Apollo 14. Good morning. How do you read me?

CAPCOM Roger. Good evening, Apollo 14. Loud and clear.

SC Good morning, Bruce. Do you have the consumables update for me?

CAPCOM Roger. Are you ready for it?

SC Any time you're ready to give it.

CAPCOM Okay. Consumables update.

SC Good morning.

CAPCOM GET up 75 plus 33. RCS total 83 percent. Quads in order, 83, 83, 82, 84 percent. Hydrogen, 72.4, 72.8. Oxygen, 89, 87, and 38.

SC - - 14, do you read me?

CAPCOM Roger, 14. Reading you loud and clear now. We had another antenna switch. Over.

SC Alright I lost you after the first hydrogen tank.

CAPCOM Okay. Hydrogen tank 172.4, 72.8. Oxygen 89, 87, 38. Over.

SC I only got first -

CAPCOM Say again, your last, Ed?

SC Rog. And I only got the first oxygen tank. Try me again on 2 and 3.

CAPCOM Okay. Tank 2, 87 percent. Tank 3, 38 percent. Over.

SC Roger. I got 75, 33. RCS total 83. Quads are 83, 83, 82, 84. Hydrogen 72.4 and 72.8. Oxygen, 89, 87, 38.

CAPCOM Roger. Are you all eating breakfast up there now?

SC And our - we're starting. The cooks are in the kitchen at the moment. Our radiation readings for last night or this morning are 16045 for Al, 1042 - 01042 for Stu, and 05038 for Ed.

CAPCOM Roger. 16045 for Al, 01042 for Stu, 05038 for Ed and how about quantity of sleep? Do you have any comments on that? Over.

SC Rog. For Al, 6 hours, Stu 6 1/2, and Ed 6 1/2.

CAPCOM Roger, Ed. And Ed, when you - when you all feel prepared we've got quite an extensive batch of paper work to pass up to you here.

SC Okay, Bruce. Stand by one.

CAPCOM Roger.

SC Is it all going to be associated with the flight plan?

CAPCOM Well, let's see what we've got. We got a comment on TFM, we've got flight plan update, we've got a docking probe status report, we've got a pericynthion plus 2 abort pad, we will have an LOI abort chart in numbers-criterion update, we'll have some questions for you on the cosmic ray flashes, and when it comes in, we'll have a procedure for you for checking our the ascent stage battery number 5 in the LM. Over.

CAPCOM Also the sports news and commentary on mid-course 4.

SC Okay. Why don't we get the flight plan first so that we can kind of see where we're going and then we'll string the others out throughout and after breakfast.

CAPCOM Okay. Actually, I think you were looking over my shoulder, because the flight plan update is about the simplest of the whole bunch. What we're aiming towards here -

SC - we're looking over your shoulder.

CAPCOM what we're aiming towards here is getting you into the LM shortly after mid-course correction for to do a little more systems detective work on the ascent battery 5 and make everybody feel a little warmer down here and of course the rest of the LM is still in 40 shape. At 76 hours in the flight plan I would like you to pressurize the LM as required. Over.

SC Okay. 76 hours, pressurize the LM as required.

CAPCOM Roger. At 77 hours, plus 4 or 5 minutes, which is right after mid-course 4, maneuver to moon view attitude. And that attitude is presently contained in the flight plan at 78 plus 55 and is roll 35 - -

END OF TAPE

CAPCOM is roll 352110311. Over.

SC Roger. Maneuver to moon view attitude and say again the angles. I understand that's at 77, 45 right after mid-course 4.

CAPCOM Roger. Angles are 352110311 and they are currently in the flight plan at 78 plus 55.

CAPCOM Are you still there, Ed?

SC That's affirm. Okay, I have moved it from 78, 55 to 77, 45.

CAPCOM Roger. And this is a good attitude for LM communication on AFT OMNI and the procedure that we'll have for you later on will have the S-band up for telemetry but not for voice, so you want to use AFT OMNI? At 78 hours, or from 78 hours to 80 hours even we have blocked out for LM checkout of the ascent batteries so you can plan on IVT to the LM at about 78 hours and be back out by 80. Over.

SC Okay. Understand that the attitude we're going to is good for the LM AFT OMNI and we will IVT to the LM at 78 hours for a battery 5 checkout and be back plan to be back at 80 hours.

CAPCOM Roger. And meanwhile back in the Command Module, Stu can press on with the rest of the normal Command Module activities such as the P52 and all that.

SC Okay. You're going to have some good words on the ascent battery 5 for me you say, in a little while.

CAPCOM Yes, indeed. Joe Engle was just over in the LMS here in Houston running through the thing and it's a fairly long procedure as far as handwriting goes but relatively straight forward and we'll cover it for you in detail.

SC Okay.

PAO Joe Engle is the Lunar Module Pilot on the backup crew.

CAPCOM Would you like a general breakdown on what we plan to do?

SC Stand by until you're ready to read it out and then you can give me a summary before.

CAPCOM Roger.

SC Stu. Ready for the next item.

CAPCOM Okay. This is the docking probe status summary. The conclusion down here is that on your final successful attempt the probe's spring started to compress slightly followed by capture latch engagement and the dock latch went barber pole and then the bottle fired and retraction was normal, although the time was somewhat shorter due to the continued firing of the service module RCS. The talkback operation during initial extention and the final docking plus the accelerometer data, the capture

CAPCOM latch release mode occurrance during the extentions all indicated normal extention, capture, and retract sequence. Some consideration was given to the possibility that the RCS thrusting compressed the probe until the docking latches engaged, but this would have required more force than the RCS provides. As we mentioned yesterday, we're still go for the mission. Over.

SC Okay. And I think I'd like to have you repeat that after Al and Stu get on the headsets so that I won't have to write the whole thing down. I think they'd like to hear it.

CAPCOM Okay. How about a pericynthion - -

SC Go ahead, Bruce.

CAPCOM Okay, Ed. We're getting a lot of noise on the downlink right now. Let's stand by until after the shift antenna again.

PAO Astronauts Dick Gordon, Pete Conrad, Joe Engle and Phil Chapman are currently on the CAPCOM console with CAPCOM Bruce McCandless. And we're continuing to get quite a bit of noise on the downlink as we - as the spacecraft rotates from one OMNI antenna to the next.

CAPCOM Okay, 14. How do you read now?

SC Loud and clear, now, Bruce. Okay, our status at the moment - we're going to hold the probe report until Al and Stu get on the headsets. Let's press on to the next thing you have.

CAPCOM Okay. Pericynthion plus 2 abort pad, standing by, P30.

PAO The pericynthion plus 2 abort pad, which McCandless is preparing to read up to the crew is an abort maneuver which would be available to the crew to perform if for some reason they were unable to go into lunar orbit.

SC Okay. LOI plus 2.

CAPCOM Roger. Pericynthion plus 2 abort pad, SPS G&N, 63300 plus 090 minus 033, TIG 0843520.

SC Bruce, hold it a minute.

SC Okay. Would you start over again for me, please?

CAPCOM Will go, Ed. This is a pericynthion plus 2 abort pad, SPS G&N, 63300 plus 090 minus 033, TIG 084352003 minus 07115 minus 00531 minus 12768, roll NA 084 pitch, yaw NA. The rest of the pad is NA. This is a SPS docked burn and the attitudes are based on the landing site REFSMMAT. Read back. Over.

SC Okay. It's pericynthion plus 2 SPS G&N 63300, plus 090 minus 033, 84352003 minus 07115, minus 00531 minus 12768, roll NA pitch 084, yaw NA or is that 000. The rest of the pad is NA. SPS docked landing site REFSMMAT. Over.

CAPCOM Roger. And now on your - -

END OF TAPE

SC Roofs vents, over.

CAPCOM Roger, I now have your midcourse 4 pad. I think you're loosing ground on me down here. They seem to be piling up faster than we can get them read up.

SC Okay, Bruce, on the angles on that one. The roll was NA, pitch was 84, and yaw was zero. Is that correct?

CAPCOM Yaw was NA. Actually if you want the numbers, roll would be 356, and yaw would be 009. We understood there was a previous agreement that you were just going to use pitch for checking, and you would take the roll and yaw as computed by P40, over.

SC Okay.

CAPCOM Okay, let me hold off on this midcourse 4 pad a minute. I can give you just a seconds worth of discussion on the thing. It's coming out to 3.8 feet per second, and this is very close to your SPS minimum impulse. It'll be 0.69 seconds of burn time compared to your guaranteed 0.50 min impulse, and when you get down to delta vc the value of 2 tenths is what they want set in the counter. Over.

SC Okay, understand that.

CAPCOM Okay, midcourse correction number 4, SPS G&N 63375 plus 090 minus 033 tig 077 the 3 aid, 1398 minus 00016 minus 00028 plus 00021, roll 011, 249, 325, noun 44 na. Delta vt 00038, 001, 00002, sextant star, 01 1732 335 GDC align serious and radial, 230, 170, 002 no ullage. High gain antenna angle, pitch plus 32, yaw 290, narrow beam automatic mode, read back, over.

SC MCC4, SBS G&N63375 plus 090 minus 033 and 077 38 1398, minus 00016 minus 00028, plus 00021, plus, or rather 011, 249, 325, noun 44 na 00038, 001, 00002, 01, 1732, 335, serious radial, 230, 170, 002 no ullage. High gain antenna angle, plus 32, yaw 290, you want it on narrow and auto.

CAPCOM 14, Houston, read back correct.

SC Houston, this is 14, how do you read now?

CAPCOM Okay, when you have a chance we'd like po and accept Ed, and we'll uplink you the midcourse 4 target load and a new state vector, over.

SC Okay, Bruce, you have po and accept.

CAPCOM Okay, Ed, you may recall our discussion on TFM last evening, with regard to the sign of the quantity in R3. We've had a request down here that you, on the CMC and the LGC, load in the TFM from the pad that we passed you. That is the quantity using all positive signs. Do you still have that handy?

SC Let me double check.

SC Right, those are the numbers 00006, 39223 and 16020, is that affirm?

CAPCOM Roger, that's the one.

SC Okay, we'll (garbled).

CAPCOM Let us finish with the uplink first. Okay, Ed, we have a rather detailed change to the LOI mode 1 DIPS of work chart, and numerical data. This is found in the flight plan in the contengency check list and the numerical sculpture that's on one of your cue cards. It'd probably be easiest if you broke out the flight plan say, and went through it with me.

SC Okay, did you get my read back on the midcourse 4 pass?

CAPCOM Uh -

SC It sounded to me like you droped out before I finished reading it back.

CAPCOM Yea, as far as I can tell I got all of it. I recall definately down through serious and radial, and I believe I recall your reading the high gain antenna angles back, so I'll roger for that.

SC Okay, thank you. Okay Bruce give me a few words on the DIP support changes before we start giving the actual numbers.

CAPCOM Okay, you have a change in the DIPS delta v available line due to its -

END OF TAPE

CC available line due to a different engine model or a change in the spacecraft weight and a change in the usable propellant from the time that this curve was calculated. You have a change in the 2 other lines, which LOI plus 2R and LOI plus 30 minute abort DELTA V's based on the change in your orbit from the nominal plan. This all backs up to the 40 minute late liftoff. And the numerical changes are a consequence of that, also. Over.

SC Okay, let's start through then slowly now and we'll see if we can correct them.

CC Okay. Over here in the DPS DELTA V available line, the left hand intercept is at abort DELTA V of 1966 feet per second at LOI DELTA V of 0. The right hand intercept on the vertical dashline comes at an abort DELTA V of 2130 and the LOI DELTA V of 725. Then connect the 2 intercepts together with a straight line. Over.

SC Okay. Stand by. The first one is 1966, let's just take them 1 at a time, and I'll plot them.

CC Roger.

SC And you say the right hand intercept is 21 what?

CC Is 2130, 2130 and it falls on that vertical dash line 725. It separates mode 1 from mode 2.

SC I got it.

CC Okay, connect them up.

CC 14, Houston. Computer's yours.

SC Okay, I'm in block. Give me the next line now.

CC Roger. In the LOI plus 2 hour abort DELTA V region. The left hand intercept is 1477 feet per second. Over.

SC Copy. 1477.

CC Roger. And right hand end point is at 2026 abort DELTA V, and LOI DELTA V of 238. It should intercept your DPS DELTA V available line where it crosses the boundary between the mode 1 2 hour and the 1 30 minutes. Over.

SC Roger. Took care of that and (garble)

CC Okay, are you ready for the next one?

SC Okay, ready for the next one.

CC Okay, over in the LOI plus 30 minute abort region, the left hand intercept, with the boundary between mode 1-2 hour and mode 1-30 minutes occurs at abort DELTA V of 1517 and LOI DELTA V of 238. Over.

CC And we're going down in the mud again, Ed. I'm going to wait for the antenna changeover before we continue with that one.

SC Okay, I've got you at 1517 for the first one.

CC Okay, 14, Houston. We're coming back in now. I confirm 1517 for the left hand edge, and the right hand intercept is at abort DELTA V of 2395 on the 725 DELTA V magnitude dash line. Over.

SC 2375. Is that correct?

CC Negative. 2395. Over.

SC Okay. 2395.

SC Okay, Bruce. Have that line plotted.

CC Okay. And all 3 of those lines ought to be pretty close to parallel to the existing lines, you concur?

SC Yes, they sure are.

CC Okay. Over to the numerical data. Come on over to the little block there and on the second line down under burn time starting out with 0 plus 33, mode 1 loose. It should be 0 plus 33 thru 1 plus 19 and a DELTA VM is 238 through 570. Over.

SC Okay. The burn time from 033 to 115 should be 033 to 119 and the corresponding DELTA VM is 238 to 570.

CC Roger. Next line down. The burn time is 1 plus 19 through 1 plus 40 and the burn time or the DELTA VM is 570 through 725. Over.

SC Okay. We change from 119 to 140 and DELTA VM is 570 and 725.

CC Roger. The next line down you change 1 plus 39 to 1 plus 40 so it reads 1 plus 40 through 2 plus 41. Over.

SC Okay. The next line is 140 to 241.

CC Okay, now down below it, you've got a column for updated times. And I'll read you the updated times.

SC Okay.

CC Okay. GET and LOI ignition 82 plus 36 plus 47, 83 plus 06 plus 47, ROLL 127264348, CSM IMU angles GET abort ignition 84 plus 36 plus 47.

END OF TAPE

CAPCOM plus 47, the next block down under LM FDAI angles, the tig, 84 plus 36, plus 47, 170, 261, 000.

SC Okay, Bruce the only time I think I've missed is the CSM IMU angles at LOI plus 30.

CAPCOM Okay, 83, plus 06, plus 47, over.

SC Okay, I read back GET and LOI ignition update is 82 37 47, the LOI plus 30 is 83 0647 CSM IMU Angle for LOI plus 2 is for a time of 84 36 47 and the LM angles for that time are, the LM FDAI angles for that time are 84 36 47 and they are 170 261, 000.

CAPCOM Okay Ed, the read back was correct except that you omitted the roll pitch and yaw angles under CSM IMU angles for LOI plus 30.

SC Rog, I didn't hear them. Did you say them. Are they the same?

CAPCOM Okay, Roll and yaw are the same. Pitch has changed from 263 to 264, over.

SC Oh those, okay, I thought I read them to you Bruce. I have them 127, 264, and 348.

CAPCOM Roger, readback is correct, and we've got some news when you're ready.

SC Okay, let's hold off and let the other guys get on their headsets and have some news while I get some breakfast.

CAPCOM Okay, and those changes need to be made in the contingency checklisted flight plan and on your cue card.

SC Roger.

PAO This is Apollo Control at 76 hours 37 minutes. We are beginning a shift hand over at this time. Flight Director Jerry Griffin coming on to replace Flight Director Milton Windler and the capsule communicator on the upcoming shift will be astronaut Fred Haise. We do anticipate a change of shift briefing, probably within about 30 minutes of the shift handover which is scheduled to occur at 7:30. Also during the S4B impact, which will be occuring early tomorrow morning at about 1:26 AM central standard time, we will have Dr. David W. Strangway, who is chief of the Geophysics branch at the Manned Spacecraft Center available in the newscenter briefing room to provide background on the event and also to do what real time data analysis is possible. We will have video from the control center piped into the briefing room and we'll have available such things as video of the seismic data that we are expecting to receive on the Apollo 12 passive seismometer. At the present time we are showing that the impact will occur at a ground elapsed time of 83 hours 17 minutes, 55 seconds, and the current impact coordinates for

PAO the S4B are 7 degrees, 52 minutes south and 26 degrees 3 minutes west. And at the present time, we show Apollo 14 at 14,022 nautical miles from the moon. The spacecraft velocity up now to 3,624 feet per second.

CAPCOM Apollo 14, this is Houston. We would like you to reload TSM prior to midcourse 4, over.

SC Okay, Bruce, we'll reload TSM, and I'll do that now. And the Delta V test went real well and the no bias check with a minus 100 at the start went to a minus 98.4.

CAPCOM Roger, we copy. Did you say 98.4, Stu?

SC That's affirmative, 98.4.

CAPCOM Roger.

SC Okay, Bruce, we reloaded and there it is if you'd like to check it and make sure we're all squared away.

CAPCOM Okay, stand by. Roger we concur. Stu, it looks good.

SC Okay.

END OF TAPE

CAPCOM Apollo 14, Ed. This is Houston. Do you have a copy of the LM activation check list in the Command Module at this time or did you leave both of them in the LM? Over.

SC We have them here in the Command Module.

CAPCOM Roger. Thank you.

SC Okay, Bruce. The torquing angles are on the DSKY and I'll be torquing at 765130.

CAPCOM Roger, Stu.

CAPCOM Okay. It looks good from down here, Stu.

SC Okay.

SC Houston, 14.

CAPCOM Go ahead, 14.

SC Okay, Bruce. Looking over the flight plan we moved up that maneuver to the moon view attitude and I'm going to go the way I did back here right after mid-course 4 instead of where it shows over 7850 if you all agree.

CAPCOM Roger. We concur

SC Okay.

END OF TAPE

SC Houston, 14.
CAPCOM Go ahead, 14.
SC Okay. The pad value for DELTA VC is 0.2 and you all gave us that before we ran our NULL BIAS check. Is that still a good (garble)?
CAPCOM Yeah, that's still a good number Stu.
SC Okay.
CAPCOM 14, Houston.
SC Go ahead.
SC Go ahead, Houston.
CAPCOM Okay. We'd like to get the high gain whenever you can crank it up.
SC Houston, 14 on the high gain. How do you read?
CAPCOM Loud and clear Ed.
SC Okay.
PAO This is Apollo Control 77 hours 27 minutes ground elapsed time. Flight Director Gerry Griffin who heads up the gold team of flight controllers is settling in to his chair in the middle of the room and having hand-over from Flight Director Milton Windler off going shift. Meanwhile aboard Apollo 14 the crew's making preparations for the midcourse correction burn number 4 upcoming in 9 minutes and 45 seconds. That burn with an ignition time of 77 hours 38 minutes 14 seconds will be for a 3.8 feet per second change in velocity. Total burn time is .7 of a second which for that big engine is a wee small burp. The midcourse correction burn number 4 in local time will be 8:01:14 central time. Communications engineers asked that the crew be asked to swivel the high gain antenna for a better lockon upcoming on this burn - apparently the communications is somewhat spotty at this time. We're standing by live on air-ground with Apollo 14 for the up-coming burn.
CAPCOM 14, Houston.
SC Go ahead, Houston.
CAPCOM Okay. Your high gain is oscillating a bit there. Want you to try another acquisition Ed.
SC Got you Fred. We've tried it twice and it's still doing it. I'll give it one more go.
CAPCOM Okay.
SC Houston, 14. That seems to be the best we could do. It's still oscillating. Got another sugges-tion?
CAPCOM Stand by Ed.

END OF TAPE

SC 14, Houston.

CC Okay, Ed. Suggestion is to take the servo electronics switch, panel 2, go to secondary and then try the reacq.

SC Okay.

SC Okay, Houston. I think we've finally got it up on the fourth attempt.

CC Okay, Ed.

PAO This is Apollo Control coming up on 1 minute away from midcourse correction number 4 burn which will lower the nearest approach altitude from about 67 nautical miles to 60 nautical miles after the burn. 50 seconds.

SC Okay, Houston. We get about 40 seconds to burn. We're ready to go on time.

CC Roger, Al.

SC Okay, we had a good burn.

CC Okay, Roger, Al.

SC Okay, Houston. 14, with a burn report.

CC Okay. Go ahead, Al.

SC DELTA VC minus 2.6 and the fuel and oxidizer, no appreciable change.

CC Okay DELTA VC minus 2.6 and the fuel ox, no change.

SC That's correct.

CC 14, Houston.

SC Go ahead.

CC We would like AUTO on the high gain now, Ed and just one question. You mean you tried 4 times on the secondary servo electronics to get locked up?

SC Yes, it was about that. It could be that I wasn't giving it enough delay time before I tried something else when it was in the narrow position, but I thought I was and I don't know what I did differently on the last attempt that did work then the previous attempts which didn't work.

CC Okay, you tried to lock up in narrow rather than wide. Is that correct?

SC Roger. I went from wide to medium to narrow.

CC Okay.

SC Houston, 14. The LM command module Delta P is zero. We're starting to remove the tunnel hardware.

CC Roger. And are both Al and Ed on the headsets now?

SC That's affirm.

CC Okay. Looking at -

SC Yeah, we're all on, Fred.

CC Okay. Looking at the procedure here for the business in the LM. Looks like the better way to handle it rather than have you write it all down is for me to just give it to you on a step-by-step basis after you're in the LM and set and ready to go and I'll just have somebody, Joe here, checking me off as we do it.

SC Okay, we'll let you know when we're in there and we'll keep command module comm in there.

CC Roger, Al.

SC Houston, 14.

CC Go ahead, Ed.

SC Just a quick comment. We're passing the moon out our rendezvous window right now. It seems to be growing noticably in size. We've reached the point where we're running downhill very rapidly toward it.

CC Roger, Ed. Showing you about, oh it looks like about 205 000 out now.

SC Roger.

SC Hey, Fred, old boy, this moon view attitude is just what it says, it's got it framed right in the hatch window.

CC Incredible.

SC Yes, just like everything else, you all do good work.

PAO This is Apollo Control at 77 hours 55 minutes GET time. There will not be a change of shift briefing with the maroon team flight director, Milton Windler, inasmuch as he plans to stay in the control center during this checkout of the lunar module battery system. The next change of shift press briefing will be following the end of the gold team shift. This is Apollo Control still live on air-to-ground in the mission of Apollo 14.

SC Houston, Apollo 14.

CC Go ahead, 14.

SC Okay, Fred-o, I'm through the tunnel and ingressing the LM at this point. What's about the first thing you want me to head for?

CC Okay, I'll let Joe talk to you here and kind of give you a few words on the big picture and then we'll start in.

SC Okay.

CC Okay, Ed. What this is going to amount to is an abbreviated - a very abbreviated power up and we will transfer to LM power so Stu, you can stand by and we'll get our own times on that. Now, Ed, if we have a COMM problem any time during this and we are out of configuration, just get the activation checklist and go to page 1-17 and complete the deactivation from that point on. And Ed, if you're ready to go now. We'll start through here.

SC Okay, Joe. How about giving me a quick overall picture of the problem as you saw it from the ground. I don't see much of anything here that is indicative of a problem.

CC Okay. Just a second here.

END OF TAPE

CAPCOM Okay, Ed. I wanted to get the values correct here. TM picked up about 3 tenths of a voltage - of a volt low on battery 5, which gave some concern and primarily we just want to verify that perhaps we're not - we don't have a gauge that's giving us that much of a difference rather than the battery itself.

SC 3 tenths of a volt?

CAPCOM That's affirmative. That's open circuit voltage, Ed.

SC As I recall, we read - -

SC Rog. As I recall, we read them off 1/2 a volt different. It's 36 1/2 to 37. Is that right?

CAPCOM Roger, Ed. That was half a volt onboard and the telemetry showed the 3 tenths down here.

SC Okay.

CAPCOM Okay. And essentially, Ed, what we're going to do is put the - put both batteries on an open bus to read out both bus and battery voltages and if we're not satisfied with the readings at that point we'll go ahead and load up the LMP buss and - put a load on it, rather and check the battery performance both by itself and sharing a load on the LMP bus.

SC Okay. Understand what you're going to do.

CAPCOM Okay. Let's press on and I'll read the items off in checklist fashion and I'll read one or two itmes at a time, Ed, depending on if they're in the same proximity and wait for your verification.

SC Okay. I'm ready.

CAPCOM Okay. Up front, let's turn the flood lights to all.

SC Flood lights are at all.

CAPCOM Okay. Window shades down.

SC That's in work. Okay. Window shades are down.

CAPCOM Okay. And back on ECS panel now. The descent water and descent oxygen both open.

SC Water and 02 at open.

CAPCOM Cabin repress to AUTO.

SC Cabin repress in AUTO.

CAPCOM And on panel 16, cabin repress circuit breaker CLOSED.

SC Repress breaker CLOSED.

CAPCOM Okay. And Kittyhawk we're ready to transfer to LM power now, and if you'll give us the mark we'll get the time.

SC Okay, Joe, on my mark. 3, 2, 1, MARK.

SC I have power.

CAPCOM Okay, Ed. We've got it. And now on panel 11 and 16. The translunar bus tie breakers both CLOSED.

SC Translunar bus ties are closed.

CAPCOM Okay. On panel 11 signal conditioner one CLOSED.

SC Conditioner one's CLOSED.

CAPCOM Over on the other side on 16, signal conditioner two CLOSED.

SC CLOSED.

CAPCOM Okay. Under EPS, the displays and the descent ECA control both CLOSED.

SC Okay. EPS displays and deca - descent ECA CLOSED.

CAPCOM Okay. Now verify the descent batteries all four talk backs are on LOW and the descent battery talk back is grey.

SC That's verified. That's verified.

CAPCOM Okay. On panel 16 under COMM primary S-band both breakers CLOSED and the PMP CLOSED.

SC Okay. COMM primary S-band (garble) and transmitter receiver PMP CLOSED.

CAPCOM Okay. And while we're doing this you can keep your eye on that bus voltage whether or not we need to go to high taps.

SC Okay.

CAPCOM Okay. Still on 16, the PCMTE breaker CLOSED.

SC PCMTE CLOSED.

CAPCOM Okay. And on 16 ascent ECA and ascent ECA control both CLOSED.

SC Okay, ascent ECA control CLOSED.

CAPCOM Okay, Ed. Now on your audio panel on the LMP side, S-band TR to TR.

SC S-band TR, TR.

CAPCOM And under COMM under the S-band, TM, Prime, Prime, OFF TCM.

SC Okay, TM, Prime, Prime, OFF TCM.

CAPCOM Okay. And then OFF reset on your range.

SC Okay. OFF reset and then 27 volts. Let's switch to high taps.

CAPCOM Okay. Very good.

SC Okay, I'm on high taps.

CAPCOM Okay. Very good. Now on your telemetry, Ed. We'll want OFF and HIGH.

SC And OFF and HIGH. You have it.

CAPCOM Okay. Now on the S-band antennas you might take a quick check and see which is your best OMNI there.

SC Well, since we don't have those meters powered up, I don't have anything to tell by.

CAPCOM Okay. We've got data now, Ed. Thank you.

SC Okay. I'm on AFT.

CAPCOM Okay, now stand by one and we'll if we're ready to press on here.

CAPCOM Okay, Ed. We're ready to press on and for your information on telemetry here, we're still showing that ascent about 3 tenths of a volt low as in 5. Okay, Ed. We're ready to pick up now on panel 11, EPS cross tie balance loads OPEN.

SC Okay. EPS cross tie balance loads panel 11.

CAPCOM That's affirmative.

SC Is OPEN. That's makes them both OPEN now.

CAPCOM Okay. Now we're going to turn OFF batteries 3 and 4, so battery 3 and 4 high voltage to OFF reset and you may get a DC feeder fault light here.

SC Bat 3 and 4 you want the OFF reset. I have both balance loads at bus cross tie bus open. In other words you want to dump the commander's bus, is that correct?

CAPCOM That's affirmative.

SC Okay. Here they go.

SC And I have a feeder fault.

CAPCOM Okay. You do have a feeder fault?

SC Have a feeder fault light.

CAPCOM Yes, that's what I mean. Okay. Very good. Now on panel 11, Ed, they want to open all the circuit breakers on panel 11 except signal conditioner 1, the DC bus volt, and both Bat feed tie breakers.

SC Okay. You want them all open except signal conditioner 1, the DC bus volt, is that affirm?

CAPCOM That's affirmative.

SC Okay. It's open. We never got it closed. I'm closing it now. Okay, Joe, say again the ones you want closed.

CAPCOM Okay, Ed. We have 4 that we want closed. They are the signal conditioner, signal conditioner 1, Bat bus volts, and both bat feed tie breakers.

CAPCOM Now, you're breaking up. Give me the last three again. I have the signal conditioner, but I still don't get the last three.

CAPCOM Okay. The DC bus volt and both bat feed tie breakers.

SC Okay. Both bat feed ties, DC bus volts and the signal conditioner. I'm now pulling the rendezvous radar heater, the stand by breaker, the landing radar heater breaker, annunciating docking component lighting breaker. IMU stand by. Descent ECA, translunar bus tie. I now have 4 bus - 4 circuit breakers closed, the remainder are opened.

CAPCOM Okay. And you have the IMU stand by breaker open, is that affirm?

SC That's affirm.

CAPCOM Okay, Ed. Our next step now, we'd like to bring battery 5 back up, ON.

SC Okay, battery 5 back up, commander feed is ON.

CAPCOM Okay. Very good.

END OF TAPE

SC Okay battery 5 back up commander feed is on.

CAPCOM Okay very good, and onboard there if you'd compare both your battery and buss voltages and give us a readout please.

SC Okay, battery 5 is reading about 35.8 and the commander's buss is reading 35.8.

CAPCOM Okay Ed Batt 5 back up off.

SC Batt 5 back up off.

CAPCOM Okay Ed, battery 6 normal, on.

SC Battery 6 normal is on.

CAPCOM Very good, now give us battery and buss voltages please.

SC Okay, I read 36 on the bus, 36 on the battery.

CAPCOM Okay Ed, now battery 5 back up to on, and when you do it see if battery 6 pulls any of battery 5's load.

SC Okay, stand by.

SC Battery 6 back up on now. And looks like the voltage on 6 rose just a little bit and I see no change in current. It appears that it's sharing the load they're both at 36 plus.

CAPCOM Okay, now let me verify, Ed. You do have battery 5 on back up and battery 6 on normal.

SC That's affirm.

CAPCOM Okay, stand by 1 now and let us look at the stuff here.

SC With your concurrence I was looking at 6 when I brought 5 back up on. Let me shift it; my temp monitor, my power temp monitor and watch 5 and cycle them if that's okay.

CAPCOM Okay Ed, first could you verify ascent ECA control breaker is closed please.

SC That's affirm ascent ECA control is closed.

CAPCOM Okay, and the ascent ECA breaker also.

SC That's negative.

CAPCOM Okay, we'd like ascent ECA closed on 16, Ed.

SC Okay, you've got it.

CAPCOM Okay, Ed now rotate, we'd like you to rotate battery 6 to off momentarily and then back to normal power and you can watch battery 5 voltage there on your monitor.

SC Okay, battery 6 coming off. Now when I cycle battery 6, the battery 5 voltage comes up when battery 6 is brought on the line. It drops down when battery 6 is off the line, however by watching 6 I do not see any current drain.

CAPCOM Yea, we concur, we're seeing the same thing

CAPCOM here Ed. And stand by just a moment in this configuration. Okay Ed, next function, let's take battery 5 back up, correction, battery 6 normal feed off.

SC Battery 6 normal is off.

CAPCOM And battery 5 back up off.

SC Battery 5 back up off.

CAPCOM Okay Ed we can turn battery 3 high volt and battery 4 high volt back on now.

SC Okay, battery 3 high volt is on. Battery 4 high volt is on.

CAPCOM Okay Ed -

SC 5 volts.

CAPCOM Okay, very good. Okay Ed, if you have your activation, do you have your activation checklist there with you?

SC That's affirmative.

CAPCOM Okay, go ahead and configure panel 11 now as per page 1 dash 3, and I'll have 4 changes when you get the breakers configured there.

SC Okay, configuring panel 11 as per 1-3.

CAPCOM Okay, very good. Okay, Ed, and give me a call when you get panel 11 configured there.

SC Okay, Joe, it's complete.

CAPCOM Okay, very good. Now I've got 4 breakers I'd like for you to change on 11. The cross tie balance load breaker, open.

SC Okay cross tie balance loads is open.

CAPCOM Translunar bus tie closed.

SC Translunar bus tie closed.

CAPCOM Signal conditioner 1 closed.

SC Okay, signal conditioner 1 closed.

CAPCOM Okay, and glycol pump 2 closed.

SC Okay, I've closed the following circuit breakers in addition to 13, signal conditioner 1, glycol pump 2, translunar bus tie, and I've opened a cross tie balance loads.

CAPCOM Okay very good, Ed. What we want to do now is put some loads on the LMP bus for the load test. Now you can go over to panel 16 Ed, and on panel 16, I'd like the, under instrumentation, I'd like the signal sensor closed.

SC Okay, it's closed.

CAPCOM Okay and under ECS displays closed.

SC ECS displays closed.

CAPCOM And on under heaters, the RCS system A and B, all 4 heaters circuit breakers closed.

SC Okay, under heaters, RCS system AB 2 quads 1234 are closed.

CAPCOM Okay, very good. Now back on panel 11

CAPCOM We have AC buss A and B buss tie inverter breakers all 4 of them closed.

SC Okay, AC buss A and B and closed the 4 buss tie inverter breakers.

CAPCOM Okay, under AC buss A, the AC buss volts closed.

SC AC buss volts closed.

CAPCOM Okay, under ACB, the system engineer window heater closed.

SC Okay, SE window heaters closed.

CAPCOM And under AC buss A the commander's window heater closed.

SC Okay, commanders window heater closed.

CAPCOM Okay, now if you'll scurry back over to the other side under 16, we have EPS inverter 2 closed.

SC EPS inverter 2 closed.

CAPCOM Okay, Ed, now if you'll check AC bus and turn on inverter 2, turn inverter switch to number 2.

SC Okay, Joe, and I'm reading right up at the high into the green band. It's under 38 volts indicated

CAPCOM Okay, very good. Now turn your monitor to battery 1, and we'd like the RCS system AB 2 quads heaters all 4 to the manual position Ed.

SC Okay, they're in manual.

CAPCOM Okay, now let's bring battery 5 normal switch on.

SC Okay, stand by. Battery 5 normal is coming on.

CAPCOM Okay, very good.

SC And battery 5 seems to have picked up about 12 amps indicated.

CAPCOM Okay.

SC And is sharing the load with 1 and 2 apparently.

CAPCOM Okay, looks good and stand by just a few more seconds Ed. Okay Ed, now let's start bringing, taking the descent batterys off. First of all we'd like battery 1 to off, reset.

SC Battery 1 off, reset.

CAPCOM Okay, and let's remain in this configuration for a few seconds here.

END OF TAPE

CAPCOM Okay Ed, now bring battery 2 off RESET.

SC Okay. Battery 2 is OFF and BATT 5 is carrying the whole load at 30 AMPS.

CAPCOM Yeah. It looks good here.

SC Looks good to me.

CAPCOM Okay. Give us about a minute here Ed and we'll press on with the next step.

SC Okay, sure have a good moon view out the Commander's window here.

CAPCOM Okay Ed. We're ready to pess on now. Let's turn battery 6 back up ON.

SC Okay. Battery 6 backup is ON.

CAPCOM Okay. We'll remain here for a few seconds and take a look at it.

SC Okay 5 and 6 just be sure and load it.

CAPCOM Okay Ed. Now Battery 6 back up OFF.

SC Okay. It's off.

CAPCOM Very good. Now let's take batteries one and 2 high volt to ON.

SC Okay. One and two high volts are ON.

CAPCOM Okay. Battery 5 NORMAL - OFF. RESET.

SC 5 off. RESET.

CAPCOM Okay. Now on the circuit breakers over there, the RCS system A B 2 quads all 4 breaker OPEN.

SC All four open.

CAPCOM Okay. You can turn all four heater switches to the OFF position.

SC That's completed.

CAPCOM Okay. Now turn the inverter switch OFF.

SC Okay. It's OFF.

CAPCOM Okay and inverter 2 breaker OPEN.

SC That's completed.

CAPCOM Okay Ed. Now let's finish deactivating here - that wasn't that looks like a good check. On your audio panel you can turn your S-band PR OFF.

SC It's OFF.

CAPCOM Okay. And I guess we're going to stand by here just a moment Ed.

SC Okay.

CAPCOM What we're doing right now Ed is just watching the open circuit voltage on that TM here for a few minutes and make sure its stable.

SC Okay.

SC That's using your pit juice as well.

CAPCOM (Laughter) yeah.

SC Houston, 14. Can we press off and power down we're using juice.

CAPCOM Yeah. We're just about ready to press on Ed.

CAPCOM Okay Ed. We're going now at the intercom S-band PM OFF, OFF, OFF.

SC Okay.

CAPCOM And your ranging and OFF reset to

SC Okay. You have PM OFF, OFF, OFF, OFF. OFF RESET.

CAPCOM Okay. And telemetry OFF and LOW.

SC Okay. You have OFF and LOW.

CAPCOM Okay on 16 circuit breakers Ed, under EPS cross tie balance loads OPEN.

SC Okay. Cross tie balance loads are OPEN.

CAPCOM Okay and you can select low taps on batteries.

SC Okay.

SC Low taps on the batteries.

CAPCOM Okay Ed. Now you can go back to that activation checklist and configure the both circuit breaker panels as per page 1-3 and 1-4 and I'll stand by and if you will give me a call when you're finished with that.

SC Okay.

SC Panel 11's configured.

CAPCOM Very good Ed. Okay Stu. If you're ready you can transfer back to CSM power now and we'll get the time if you'll give us a mark.

SC Hold it a second.

SC I still haven't got 16 configured yet, John.

CAPCOM Oh, okay. Stand by Stu.

SC Okay George, completed Stu's transferred power.

SC Okay Joe. Here it comes back to the CSM 321 MARK.

CAPCOM Okay Stu. We've got it. Thank you very much.

CAPCOM Okay Ed. Now on your ECS panel, you can CLOSE the descent water and oxygen.

SC Completed.

CAPCOM Okay. Cabin repress CLOSED.

SC The cabin repress is CLOSED.

CAPCOM On panel 11, on your circuit breakers the ECS dc buss volt OPEN.

SC It's OPEN.

CAPCOM And on panel 16 under ECS cabin repress OPEN.

SC It's OPEN.

CAPCOM Okay. You can roll the window shades back up now Ed.

SC Okay. The window shades are going up and the old moon is sure getting big in the Commander's window at this point.

CAPCOM Okay. Very good. You're not very far from there on the chart up there, that's for sure. Okay Ed, on panel 3, floodlight OFF.

SC Only noticeably in the last hour.

CAPCOM Okay. We copy that. And on panel 3, floodlight OFF.

SC Okay. It's OFF.

CAPCOM Okay Ed, the cabin relief and dump overhead to OPEN.

SC Verify it's OPEN.

CAPCOM Okay. Now you can IVT back to the command module and close the hatch behind you. And we thank you very much.

SC Okay. Is everybody satisfied with the checkout Joe? Are we GO?

CAPCOM Yeah. It looks good Ed.

SC Okay. The LM hatch is secured.

CAPCOM Okay. Very good Ed.

CAPCOM And Ed, we'll have some more elaborate words for you on those batteries. The battery five holds the load real good. It stands up under the load real good. I think they want to evaluate a few more parameters here and so far it looks like there's nothing to worry about.

SC Okay. Thank you.

SC Houston, 14. Should we put the hardware back in the tunnel?

CAPCOM Okay. Stand by Al.

CAPCOM Apollo 14, this is Houston. Rog, Al you can go ahead and put the hardware back in and get back into a normal configuration.

SC Okay. That's in work.

SC Okay. Will do.

PAO This is Apollo Control. 78 hours 57 minutes ground elapsed time. Apollo 14 some 3 hours 26 minutes from loss of signal as it passes behind the moon on the first coasting in to lunar orbit insertion burn coming up later this evening. Lunar Module pilot Ed Mitchell crossed over into the lunar module earlier and just - has completed a checkout of the electrical system in the lunar module in which the concern is on the low - -

END OF TAPE

PAO In which the concern was on the low voltage reading of about 3 tenths of a volt under normal of ascent battery number 5. By selectively switching the various loads back and forth between this battery and the other ascent battery, measuring the load sharing capability, the voltage readings with the various loads, it was determined as mentioned by the acting spacecraft communicator, Joe Engle, that the battery looks okay at this time, and as of now they're go for continuing toward a lunar landing mission. There's an extensive checkout of lunar module systems prior to the undocking and our descent maneuver on up till landing, but as of now, the ascent batteries, especially battery number 5 is go at this time. Some gee whiz numbers, would you believe they've disappeared from my display. At 78 hours 59 minutes ground elapsed time this is Apollo Control.

CAPCOM 14, Houston.

SC Go ahead.

CAPCOM Okay, we'd like POO and ACCEPT and we'll pump you up the state vector preliminary target mode and REFSMMAT.

CAPCOM Did you copy, 14?

SC We've got it.

CAPCOM Okay.

CAPCOM 14, Houston, the computer is yours now.

SC Okay.

CAPCOM 14, Houston.

SC Go ahead.

CAPCOM Okay, I have a preliminary LOI maneuver pad ready.

SC Okay, Fredo, I'm ready to copy your preliminary LOI 1 pad.

CAPCOM Okay, it's SPS G&N 63306 plus 090 minus 033, 082, 36 46 55 minus 28019 minus 11053 minus 02273 351 258 326 01723 plus 00584 30206 612 30131 12 2883 271 and the rest of the column N slash A. Star 15 Sirius and star 12 Rigel. Okay, on the zero mark of the set stars R align 127, T align 148, Y align 015. No ullage, LM weight 33 675.

SC Fred-o would you give me the minutes of noun 33 again please.

CAPCOM Okay, 36.

SC Okay, it's an LOI preliminary SPS G&N 63306 plus 090 minus 033, 082, 364655 minus 28019 minus 11053 minus 02273 351 258 326 01723 plus 00584 30206 612 30131 12 2883 271 the rest N A. Set stars Sirius and Rigel and 127 148 015 no ullage, LM weight 33675.

CAPCOM Okay Ed was good read back.

SC Okay.

SC Houston, 14, did you get the 93's and the torquing time?

CAPCOM We've got the 93's, Al, but we need the torque time.

SC Okay, 079 39 20.

CAPCOM Copy 079 39 20.

END OF TAPE

CC 14, Houston.

SC Go ahead.

CC Al, while you still maybe got that pad book handy. I got a TEI 4 pad ready to come up.

SC Okay, go ahead with your pad.

CC Roger. TEI 4 SPS G&N 38242 plus 090 minus 033091173852 plus 39034 plus 07063 minus 01658 181069 012 rest of column N slash A, ullage 4 jets 14 seconds, other remarks assumes burn undocked and assumes no DOI. Okay and -

SC DOI 4 and SPS G&N -

CC Okay, I've got 1 correction before you read back, Al. They gave me the docked PITCH AND YAW trim, NOUN 48s and I need to change those on you right now.

CC Stu, the PITCH should be minus 057 and the YAW trim plus 040.

SC Okay, I have it as follows: DOI 4 SPS G&N plus 38242 minus 057 plus 040091173852 plus 39034 plus 07068. I need DELTA VZ 181069012, 4 jets ullage 14 seconds, burn undocked.

CC Okay, Al. NOUN 81, I maybe heard you wrong. DELTA VY should be plus 07063 and the DELTA VZ minus 01658 and the last remark is assumes no DOI.

SC Alright. Will repeat DELTA VY plus 07063 and minus 01658, last remark assumes and no DOI.

CC Okay, good readback.

PAO This is Apollo Control at 79 hours 51 minutes GET. The countdown clock showing 2 hours and 45 minutes 37 seconds until lunar orbit insertion ignition and 2 hours 32 minutes until the spacecraft passes behind the moon on the beginning of the first revolution. Earlier, you heard the spacecraft communicator pass up to the crew all the numbers necessary for the lunar orbit insertion burn, which is now scheduled for ground elapsed time of 82 hours 36 minutes 46 seconds with a retrograde of velocity decrease of 3020 feet per second. The lunar module pilot, Ed Mitchell went into the lunar module earlier in the evening and checked out the electrical system and in watching the telemet telemeter displays here in Mission Control, Apollo program Director Rocko Petrone made the following comment: "We are happy with what we saw. We haven't found anything to preclude descent. Other ground tests are under way to further verify battery performance. During the test, battery 5 shared the loads applied very well without draining power from battery 6. The battery recovered readily after the load was removed. At one time the load was pushed to 30 amps during the test. The entire LM battery system will be thoroughly checked out during the power up of the lunar module on descent day. We did however, determine that the .3 of a volt low reading recorded earlier in the mission was not an instrumentation fault." Presently Apollo 14 is 6863 nautical miles out from the moon increasing in velocity as it falls inward toward lunar orbit. Velocity now reading 4083 feet per second. At 79 hours 53 minutes ground elapsed time, this is Apollo Control.

CC 14, Houston.

SC Go ahead, Houston.

CC Okay, Ed, if you've got a minute there, I'd like to proceed through a little bit of looking at the high gain.

SC Okay, Fredo, just 1 please.

CC Okay.

SC Okay, I'm ready. What do you want to do?

CC Okay, first match your dial of PITCH AND YAW indications with what you're reading on the indicators.

SC Okay.

CC Now, manual and wide.

SC Okay, I have it.

CC Okay, put the high gain servo electronics switch back to primary and after that go through another normal acquisition.

SC Okay.

SC It locked up immediately, Fred-o.

CC Say again.

SC The only thing different then what it was doing this morning was it was not increasing signal strength immediately upon going to medium or narrow.

CC Roger.

SC And of course it seemed to be oscillating after that. It's steady now.

CC Okay.

END OF TAPE

CAPCOM 14, Houston.

SC Go ahead.

CAPCOM Is everybody on the line now, Al, so I can pass up this docking probe status?

SC Standby one.

CAPCOM Okay.

SC Houston, can we give you a call in about 20 minutes?

CAPCOM Okay.

SC Houston, 14. I have the null bias check figures for you.

CAPCOM Go ahead, Al.

SC Okay, we went from minus 100 to minus 985.

CAPCOM Okay, we got that, Al.

SC Houston, Apollo 14. We're ready for the discussion on the probe now.

CAPCOM Okay, Al. Okay, the conclusion down here is that on your final attempt, the probe spring started to compress slightly, followed by the capture latch engagement talk backs going barber pole. The bottle then fired and the retraction looked normal, although the time was some what shorter due to the contingent firing of the command module RCS jets. The talk back operation during the initial extension in the final docking, plus the accelerometer data, and also the look see at the capture latch release motor currents during the extension all indicated a normal extension capture and retract sequence. Some consideration, Al, was given to the possibility that the RCS thruster compressed the drogue probe maybe until the docking latch is engaged but the final word was that this would require more force than the RCS could provide. And I guess the most important fact is as discussed yesterday, we're GO for the mission.

SC Okay. Do you suggest any special docking technique for the final docking and rendezvous?

CAPCOM Yeh, we're still -

SC I'm think of course in -

CAPCOM Okay, we really don't have -

SC I'm thinking of course in terms of the different masses.

CAPCOM Roger, Al. We don't have any procedure ready at this time. We're still thinking about the possibilities and we'll have that ready for you before the time.

SC Okay.

SC Hey, Fred?

CAPCOM Go ahead.

SC Okay, could we hit that again. Now, I guess I don't understand why it didn't work on the other - on the other docking.

CAPCOM Yeh, I guess we don't have that answer for you, Stu.

CAPCOM All we can say is -

SC Are - are we saying that the -

CAPCOM Yeh, we can't explain the preceding attempts but all we're saying is that the one that worked, looked normal.

SC Okay, I guess I disagree with it looking normal but the probe sure does look good now. Are you saying there's no correlation between the retraction and the - I mean using the retract bottle and getting the docking?

CAPCOM Standby one, Stu.

CAPCOM Okay, I'm not sure if I'm answering the question you asked, Stu, but what the data shows is that the - the bottle lead fired and started to pull things in before you all actually worked the switch and maybe you thought the reverse was true.

SC What let me see - - say that again, Fred. I don't understand that one.

CAPCOM Okay, I guess there's a distinction in maybe your impressions and what the data said but that you did get captured normally before the bottle was fired. Did you all have a different impression?

SC Yeh, standby one.

SC Yeh, Fred, our impression was that - say the talk backs going barber pole, which would indicate the capture by the latches, didn't happen until, oh I think as Al said the other time several seconds after he hit the retract switch.

SC Hey, but we're not trying to talk you out of anything that - we think the probe is fine, we just want to make sure we're clarified on the procedures.

CAPCOM Okay, Stu.

END OF TAPE

CAPCOM 14, Houston.
SC Go ahead, Houston.
CAPCOM Okay. We'd like POO and ACCEPT and we'll get you in the final vector and target load.
SC Okay, Fredo. You got it.
CAPCOM Okay. And I'm ready with the LOI pad now.
SC Stand by one, Fredo. Just a minute. Fred. is this going to be a correction to the previous pad or a complete new pad?
CAPCOM Al it's a final one and I think there's enough difference. You probably ought to use another sheet there.
SC Okay. Ready to copy.
CAPCOM Okay. SPS, G&N, 63306, plus 090, minus 033, 082, 364270, minus 28049, minus 11035, minus 02270, 351, 258, 326, 01693, plus 00581, 30227, 612, 301, 52, 12, 2883, 271. That's to column N/A and all the comments in the set stars information is the same as before.
SC Okay. On the LOI pad, SPS G&N, 63306, plus 090, minus 033, 082, 364270, minus 28049, minus 11035, minus 02270, 351, 258, 326, 01693, plus 00581, 30227, 612, 30152, 12, 2883, 271. The rest N/A and the set stars and ullage and LM weight remain the same.
CAPCOM Good readback, Ed.
CAPCOM And 14, Houston. The computer's yours.
SC Okay, Houston. Good.
CAPCOM 14, Houston.
SC Go ahead.
CAPCOM Ed, if you have any problem acquiring what the high gain back at LOS - or AOS and AUTO, just put her in manual and wide and we can get the dump and everything there.
SC Okay, Fredo. Will do.
CAPCOM 14, Houston. When you can work it in I got the map updates to rev 1.
SC Okay, Fredo. I'm ready to copy.
CAPCOM Okay. LOS, 82:23:58, 180:82:38:30, AOS with 82:56:27, and AOS without 82:49:15.
SC Okay, Fredo. 82:23:58, 82:38:30, and the one we'll use 82:56:27 and 82:49:15.
CAPCOM Good readback.
CAPCOM 14, Houston.
SC Go ahead.
CAPCOM Okay. When you get to the - or it's convenient in here, Ed, when you're fiddling with the O2 heater switches, we'd like the 50 watt heater breaker on 226 for tank 3 that you have open, we'd like that one closed now.

APOLLO 14 MISSION COMMENTARY, 2/3/71, 23:26 CST, 81:93 GET, 241/2

SC — You have it, Fredo.

CAPCOM — Okay.

END OF TAPE

PAO This is Apollo Control 81 hours 27 minutes ground elasped time. Still 1 hour 9 minutes out from lunar orbit insertion maneuver which will be service propulsion system burn behind the Moon. To recapitulate the maneuver pad or the numbers used by the crew in loading the - conversation here, stand by.

PAO At any rate picking up again, and recapitulating the maneuver pad for lunar orbit insertion. The time of ignition will be 82 hours 36 minutes 46 seconds, burn time 6 minutes 12 seconds. Total delta V or change of velocity retrograde, 3022 feet per second. This is calculated to produce an eliptical lunar orbit with a pericynthion of 58.1 nautical miles and an apacynthian of 169.3 nautical miles. Assuming the normal burn for lunar orbit insertion, the spacecraft will again be acquired by the ground tracking stations at 82 hours 56 minutes 27 seconds ground elapsed time. But without a burn the AOF time will be 82 49 15. Apollo 14 will settle into a lunar orbit after the LOI burn with a velocity in orbit of 5548 feet per second. Another event coming up is the SIVB impact at around 82 hours 37 minutes ground elasped time. The SIVB stage will thump into the Moon at about 8347 feet per second, which should give the seismometer at the Apollo 12 site a pretty good workout. Present altitude above the Moon 2858 nautical miles, velocity continuing to increase as the spacecraft nears the Moon, now showing 4941 feet per second. At 81 hours 30 minutes ground elasped time this is Apollo Control.

SC Houston, Apollo 14, how do you read, now?

CAPCOM Loud and clear, Ed.

SC Okay, I will now beam Charlie.

CAPCOM Okay, Ed.

SC Try again.

CAPCOM Okay, Ed, copy on the Charlie.

SC Okay.

SC Ed, Houston, we're in burn attitude.

CAPCOM Roger, in burn atitude.

SC And Houston, 14, the section star check is real good.

CAPCOM Roger, Stu.

CAPCOM 14, Houston, we've got your BG's and P 40 and they look mighty fine.

SC Okay.

SC How you doing today, Ron?

CAPCOM Real good.

CAPCOM Hey 14, Houston.

SC Go ahead.

CAPCOM Okay, Ed, we're still showing the 02 flowup a little bit for about an hour now, I just wanted to - you still venting something.

SC We turned it off a few minutes ago, it should be cocked out shortly.

CAPCOM Okay, Ed.

SC It's already started to drop down Fredo, I think it'll be down normal real soon.

CAPCOM Okay.

CAPCOM 14, Houston.

SC Go ahead, Houston.

CAPCOM Okay, Al, everything looks good down here and you have a go for LOI.

SC Thank you, we'll give it a go for LOI.

CAPCOM 14, Houston.

SC Go ahead.

CAPCOM Okay, we're about 45 seconds now to LOS, Ed, we'll see you on the other side.

SC Roger, Fredo, thank you.

PAO This is Apollo Control. We have had Loss of Signal as Apollo 14 went around the corner of the Moon for the first time. Coming up some 12 minutes from now on lunar orbit insertion burn to recapitulate some of the numbers associated with this maneuver. The ignition time is 82 hours 36 minutes 46 seconds for burn time on the big engine, the SPS engine of 6 minutes 12 seconds for a total velosity change in retrograde of 3022 feet per second. Assuming a normal burn on time the spacecraft should be reaquired as it comes around the other side of the Moon by the ground station at 82 hours 56 minutes 27 seconds. Among those people in the viewing room behind mission control room here are acting NASA Administrator, George Low, Associated Administrator from Manned Space Flight, Dale Myers and Manned Spacecraft Center Director, Dr. Robert R. Gilruth.

END OF TAPE

APOLLO 14 MISSION COMMENTARY, 2/4/71 82:25 GET 243/1

PAO Coming up on 11 minutes even until ignition for LOI. Mark. 11 minutes until ignition lunar orbit insertion burn. At 82 hours 25 minutes ground elapsed time, this is Apollo Control.

END OF TAPE

PAO This is Apollo Control, 82 hours 55 minutes ground elapsed time. About 52 seconds away from acquisition of signal here as Apollo 14 comes around the moon on it's first lunar orbit. We're standing by as we await word of lockup with the signal from the spacecraft by the stations in the manned space flight tracking network. 30 seconds, 20 seconds, they've had AOS in Honeysuckle.

SC Houston, Apollo 14.

CAPCOM Go ahead, 14.

SC Okay, Fredo. We had an extremely fine burn, the burn report as follows. Burn time 6 plus 11, residual 0.3 plus, zero and zero. Delta VT minus 7.3, 0351, oxidizer was 349.

CAPCOM Okay, 14. We copy. Wonder if you could give us a reading on the unbalance.

SC Okay. It was decreased 40, four zero.

CAPCOM Roger, Al. Decrease 40.

SC This is really a wild place up here.

SC Hey, Ron, you're not going to believe this. It looks just like the map.

CAPCOM Hey, that's great Stu.

SC Houston, 14.

CAPCOM Go ahead.

SC Okay, Fredo, you might tell Ron there that at this sun angle things look real good. Picked up that landmark 1 on the zero phase. Our zero phase target no sweat and landmark 2 I got the A part of that one at least.

CAPCOM Hey, Stu, that sounds great, by golly. It looks like our orbital science is off to a good start then.

SC Yes. For now anyway. I think we'll probably get better as time goes on but it really looks great as far as picking up all the targets that we looked at so long.

SC Houston, 14.

CAPCOM Go ahead, 14.

SC Well, this really is a wild place up here. It has all the grays, browns, whites, dark craters that everybody's talked about before. It's really quite a sight. You had us do our switching the landmarks to the map we're picking up the landmark great.. We'll easily go all the way. We had a (garbled) the type of (garbled) we are. The fact that we're climbing away from the surface is very obvious. Of course, that brings more and more of the area in detail. It really is quite a sight. No atmosphere at all. Everything is clear up here. Really fantastic.

CAPCOM Roger, Al. We copied and I think you covered all bets with the colors there.

SC That's because they're all here, Fredo

CAPCOM Al, I expected you guys - -

CAPCOM Al, I expected you to invent a new one on this flight.

SC Give us a little time. We'll think us something.

CAPCOM 14, Houston.

SC Go ahead, Fredo.

CAPCOM Ed, can you verify the flow valve that's in increase now?

SC That's verified. It's in increase. And I put it in increase about 50 seconds before the end of the burn. I left it there.

CAPCOM Roger.

SC Fredo, the - I think the best description - the description that comes to my mind, we mentioned this when we first looked at this thing, is that it looks like a plaster mold that somebody has dusted with grays and browns but it looks like it's been molded out of plaster of paris.

CAPCOM Roger, Ed.

PAO This is Apollo Control at 83 hours 8 minutes ground elapsed time. Our display here in Mission Control shows that Apollo 14's present orbit is 58.4 pericynthion by 168.6 apocynthion. Continuing to monitor air ground.

CAPCOM 14, Houston.

SC Go ahead, Houston.

CAPCOM Okay. The S-IVB impact should occur in about 8 minutes. We'll give you the word on that when it happens. And the first look at trajectory says you're in a 169.6 by 58.9.

SC Okay, Fredo. We copy that. And looking out of my rendezvous window now, we just passed over Sklodowska and those rays coming out of that bright crater that Ron and I talked about stand out a lot better than what I expected to see them, Ron.

CAPCOM He's working on it.

SC Fredo, I copy 168.6 by 56.9. Is that correct.

CAPCOM No, the numbers were 169.6 by 58.9.

SC Okay. 169.6, 58.9. Thank you.

SC And Fredo, you might pass on to Ron there or if he's listening that I was on the wrong side of the cockpit there for Old King. I couldn't tell anything about the rays coming down from Bruno. Maybe next time around.

CAPCOM Okay.

END OF TAPE

SC Okay, we're just now passing over Ansgarius and La Perouse. The cone in Bahaim is more rounded I guess than what I expected to see, (garble) you know talking about it being large and quite rounded, it is that, it's a little more subdued than what I expected to see.

CAPCOM Roger, Stu.

SC And I can see off to my right Mare Humboldt coming up and it's just as impressive as it is in the pictures. One thing that strikes me about it is the dark areas, not quite as dark I guess as I thought but we're moving in with a reasonably high sun here so they're kind of washing out.

CAPCOM 14, Houston. Hate to pull you away from the window but I got a map update and a flight plan update when you get a chance.

SC Okay, go ahead.

CAPCOM Okay, on the map update REV 2 180 degrees at 84:44:53.

SC Okay, I show 084 44 53 for REV 2 on the map.

CAPCOM Roger. That's correct Al and in the flight plan at 88 30.

SC Okay, go ahead.

CAPCOM Okay, change the LTC attitude to ROLL 352, PITCH 146, YAW 355.

SC Okay, LTC attitude 88 30, 352, 146, 355.

CAPCOM Okay, and the reason for the big change is the other angles were for SEF and they should be for BEF and that's what I just gave you. Next change is at 89 08.

SC Okay, go ahead.

CAPCOM Okay, high gain angles should be PITCH minus 46, YAW 194.

SC Okay, I show minus 46 and 194.

CAPCOM Okay, that's it, Al.

SC Thank you, Fred-O.

SC Fred-O, it's interesting up here in orbit, but we're eager to get at Cone Crater now. I'll bet it's wild down there.

CAPCOM Okay, I missed your first there, Ed. What'd you say about Cone Crater?

SC I said as interesting as this is from orbit, all it does is whet your appetite to get to Cone Crater.

CAPCOM Roger, Ed.

SC I guess in three days I haven't brainwashed him where the real science is done, Fred-O.

CAPCOM Okay.

SC His arms aren't long enough to bring him back from there.

SC Okay, you can really get the altitude rate as we're climbing from here to apogee and we're climbing

SC right up with Langrenus there.

CAPCOM Roger, Stu, and we just had S-IVB impact.

SC Okay.

SC And you get the feeling here climbing up that we're almost going up vertically here over Langrenus. It's staying right in the window and that rooster's tail coming out of Petavius B is very eminent as it swings up across and passes up by Langrenus.

CAPCOM Roger, Stu.

SC From this particular location looking out the window number 5, you can see the upper end of the Sea of Fertility and it's interesting that the only way I can tell the depart line of demarkation is albedo change. At this moment I can't tell you what causes the albedo change except it's not apparent except that the Sea of Fertility is much darker then it changes into the much lighter region up to the north.

CAPCOM Roger, Ed.

SC Say, Ron, Monte Pyreneaus looks just like the picture. You can see the rill going right across the rim, and stretching on up, Borman did his job well.

CAPCOM Okay.

CAPCOM 14, do you read Houston?

SC Go ahead, Houston, you're loud and clear.

CAPCOM Okay, just radio check, Stu.

SC Okay.

CAPCOM We lost our displays down here and just want to make sure we hadn't lost anything else.

SC (garble) Al's trying to get me to get on with it, we're trying to gawk at the same time.

SC Okay, we're just starting to pick up the edge of Nectaris now coming across with - can't quite see up far enough to - oh, yeh, there's (garble) 66 just like a neon sign out there.

CAPCOM Okay, Stu, and we're looking at the traces on the Apollo 12 seismometer and it's essentially still looking undamped.

SC Still vibrating.

SC Hello, Fred-O.

CAPCOM Yeh, that's right, Ed.

SC Is it essentially like neutral stability, Fred, or they coming down on it?

CAPCOM It looks like anything, Stu, maybe they're still building a little bit.

SC Ahhsoo.

SC There's Theophilus, Stu, there at the top of the window. Do you seeit?

SC Hello, Fred-O. I get the impression that just from looking at the real thing, these craters are a lot fresher than the photographs led me to believe. I'm

SC very surprised at how fresh many of them look.

CAPCOM Roger, Ed.

END OF TAPE

SC We've just been remarking up here, Fredo, how easy it is to find these landmarks. They just stand right out for you. It's really magnificent.

CAPCOM Let's hope cone, and triplet, and doublet show up the same way.

SC Right.

SC Yeh, Fredo, my first impression as I ... How do you read that?

CAPCOM I read you loud and clear, Stu.

SC Okay. The first impression of the Theophilus is the much difference in age than I expected. Of course, Theophilus being the youngest, but it's much more so than what I really expected. To see, and we hope to get some good photos of the line between the two there, but it's pretty amazing just how much more subdued Cyrillus is.

CAPCOM Okay, we copy that, Stu. And, we're up with you on the chart now, too.

SC Okay.

SC Okay. We're just approaching Descartes now, Fredo. I'm looking out of my rendezvous window and more of those two bright craters on either side of the landing site. It's so plan. I guess I'm suprised at the detail that you can see. Of course, the sun angles drop it down a little here, but I thought probably at Descartes the two bright leadins but, you can see many many of the fine, the fine craters in between them. And, of course, Dollond - Dolland E, and Kant they're all just very vivid. But, the detail you can see's from this altitude of the Descartes sites rather amazing.

CAPCOM Roger, Stu. I hope the LTC captured the same detail, a little greater maybe.

SC Roger, it'll be a little lower too.

SC Fredo, I ... at this point we're starting to pick up a few shadows on the edges of the craters, but the crater chain coming out of Abulfeda really can't see much difference in albedo between the crater itself and a good bit of the surrounding territory.

CAPCOM Okay, Stu.

SC Okay. We're crossing over Albategnus we can look up and see Ptolemgeus coming in to the hatch with me now. That's very stark. I'm very impressed by the different ... by albedo differences here Fredo, that I assume from photographs are really more sun angle problems or photographic problems. But going on to some that are really here that I never expected. They must indicate contacts of some sort that may be very subtle on the surface. But, I actually believe they're there if one can find them.

CAPCOM Roger, Ed. Do you mean you're talking in terms of large scale or small scale, like was in crater 4.

SC No, I'm thinking of a little larger scale than that. But, there are some in the crater floors that are very surprising, too. There's so many things that I assumed from maps were both photographic pecularities rather than real life, but by golly I think they're here.

CAPCOM Roger, Ed.

SC I think, given time, we could find flows and different units that may very well be covered with a great deal of (garble) that we were seeing suggestions of them in albedo differences and textural differences that are clearly visible from this altitude.

CAPCOM Okay.

SC I noticed some lineations and some of the craters that are suggestive of ... well I'm not sure of the sloping type of circular lineations that you see in craters. I guess to be safe I'll guess that, so I'll be safe and not say any more. I did see lineations that were surprising to me.

CAPCOM These close to the wall, Ed, or down in the floor of the crater itself?

SC Well, all up and down the wall of a few craters, but I don't recall which ones, now back along our track here a few miles. Looking down at the crater Herschel, for example, Fredo, on the ... let's see on the western wall. To me it appears as though it's really a solid chunk from the rim down to the first slope or the brake slope. Of course, this is a long ways away to be making talk like that. However, it seems it gives one of the impression of being very hard solid rock.

CAPCOM Okay, we copy, Ed. Herschel's west wall looks like essentially one unit.

SC That's affirmative.

CAPCOM And, 14, Houston. The 12 seismometers are still going. The traces right now look maybe to be almost neutral.

SC Okay.

SC Okay, Fredo. We just passed over Mosting which we'll get a better look at next time around. The baby crater chain stands out real vividly and distant expecting a pretty low Sun angle here, so any albedo differences about those will be hard to tell now. You can see the dark halo spots along the rills in Alphonsus however very vividly.

CAPCOM Alright, Stu.

SC As we approach the terminator, Fredo, with some fairly high crater walls and high country, with these long shadows it really looks rugged.

CAPCOM Roger, Ed.

CAPCOM Yes, guess right about the terminator you're starting to look into the Eastern edge of the Fra Mauro

CAPCOM formation. Is that what it looks like, Ed?

SC Yes, that's it. That's affirmative, Fredo. Unfortunately, the landing site I think is definitely in darkness. It's probably a little bit to far to the South for us to even see that area too well. A crater Gambant we can just see the ... Gambart we can just see the eastern rim of it. The western rim is just barely lighted, but the rest of it's in darkness.

CAPCOM Roger, Ed.

SC (garbled) this Sun angle (garbled) See the difference in texture very easily from an angle.

CAPCOM Roger, Al.

SC That's affirmative, you can see the streaks we've talked about are really there. That seem to lead right back toward the imbrium area, the Copernicus area. That's the most stark, desotale looking piece of country I've ever seen.

CAPCOM Roger, Ed.

END OF TAPE

SC We're almost directly over the terminator now, Fredo. And looking right down into these craters and these features that are right on the terminator. And even knowing it is a terminator and knowing what you're supposed to see, it's very difficult to make out exactly what you are looking at.

CAPCOM Roger, Ed.

SC With our current darkened adaptation it looks like you could walk along that surface into the darkness and fall into nothing. There's absolutely nothing there. Perhaps some are a little better darkened out than you can see, Earth, features on Earth some, but we can't right now.

CAPCOM Roger, Ed.

SC Hey, Fredo, we sure picked a clear day to arrive, there's not much haze in the air at all. We can see all the way to the horizon.

SC Incredible.

SC I guess we better bring the box out, then get on with the chow. Knock off our discriptions at this point.

CAPCOM Okay, Ed, you'll get another chance to look at it a couple of revs later a little lower.

SC Rog, there sure is a lot to see. Spend a lot of time talking about it.

SC Houston, Apollo 14.

CAPCOM Apollo 14, Houston, go ahead.

SC Well hello, any words for us before we go into hell.

CAPCOM Yes Sir, just getting ready to call you. The orange team is now at your service. And I have a change - slight change to the GEI 4 pad, if you'll get that one out I'll give you the change numbers.

SC Hey, Gordon, I'm having an orange drink in favor - in honor of the orange team.

CAPCOM Very good. Ed, if you're ready to copy, we have about one minute to get this in.

SC Go ahead.

CAPCOM I'll just read the change numbers, the weight changed slightly, new weight is 38230, new tick time 091 16 0690, noun 81 plus 39071.

PAO This is Apollo Control at 84 hours 21 minutes ground elapsed time. We've had Loss of Signal as Apollo 14 coasted around behind the Moon on this first lunar revolution. There will be LOS for about 47 minutes. We presently showing orbit measuring 58.5 nautical miles pericynthian by 168.8 nautical miles apacynthian. And within about 15 minutes the change of shift briefing with gold team flight director, Gerry Griffin, in the Houston News Center. Meanwhile, the orange team with Pete Frank in charge is taken over in the control center here. At 84 hours 22 minutes ground elapsed time, this is Apollo Control.

END OF TAPE

PAO This is Apollo Control, Houston at 84 hours 59 minutes now into the flight of Apollo 14. We're less than 5 minutes away now from predicted time of acquisition of the spacecraft now in lunar orbit. The lunar orbit insertion burn was literally right on the money. Our predicted versus actual numbers read as follows: predicted ground elapsed time for the maneuver was 82 hours 36 minutes 42.7 seconds. The actual time for the maneuver, 82 hours 36 minutes 42.7 seconds. Predicted delta V, 3022.7 feet per second, actual delta V, 3022.4 feet per second. The duration of the burn predicted 6 minutes 12.28 seconds. The actual, 6 minutes 12.23 seconds. We're 3 minutes 30 seconds away from time of acquisition and we'll stand by and continue to monitor.

PAO Two minutes away now from time of acquisition.

PAO One minute away now.

PAO Less than 20 seconds.

PAO We're receiving data.

CAPCOM Apollo 14, Houston. How do you read?

SC 14. Loud and clear.

CAPCOM Roger, Ed. You're loud and clear. And I've got a few pads for you when you get a chance to copy.

SC Okay. Give me a second.

PAO Our capcom is Gordon Fullerton.

SC (garbled) Ready to copy.

CAPCOM Okay. Before you do if you give us POO and ACCEPT will give you a new state vector and I have the moisting A pad. Ready to go.

SC Okay. POO and ACCEPT is (garbled)

CAPCOM Roger. Key 1 is 85:39:35, GQ 85:46:39. GCA, 85:51:39. And G3 is 85:54:09. North 8 nautical miles. Over.

SC Okay. Gordon, copy. 85:39:35, 85:46:39, 85:51:39, 85:54:09, north 8 miles.

CAPCOM Roger. Your readback is correct and the next page I have the map update, rev 3.

SC Let her rip.

CAPCOM LOS, 86:29:12, 180, 86:53:05, AOS 87:15:06. Go ahead.

SC Okay. Copy 86:29:12, 86:53:05, 87:15:06.

CAPCOM Roger. That's correct and about 3 pages on the H3 landmark pad. Ready?

SC Go ahead.

CAPCOM Okay. Key horizon is 87:49:48, GCA minus 20 seconds and 87:51:47. Over.

SC Okay. Copy for H3 87:49:48, 87:51:47.

CAPCOM Readback's correct there. We got stopped about half way through the update to the TDI 4 pad. If you or Ed is ready, I can finish that one off.

SC Roger. I'm ready. Go ahead, Gordon.

CAPCOM Okay. Did you copy the tape time?

SC Roger. I currently have it as 91:16:06 A.

CAPCOM That's correct. A new NOUN 81, plus 39071, plus 07038, minus 00818, and change the roll to 182. Pitch and yaw remain the same and everyting I didn't read is the same as the first version. Over.

SC Okay. NOUN 81 first of all the weight was 38230 and that's 291, 16, 0690, NOUN 81 is plus 39071, plus 07038, minus 00818, and roll 182, pitch 069, 0012.

CAPCOM Roger, Ed. That's all correct. That's all the updates I have at the moment. We're still standing by on the TEI 5 pad. You may keep that page ready to work on. We'll have it shortly.

SC Roger.

CAPCOM And we're through with the uplink. The computer's yours.

SC Okay. Thank you.

CAPCOM Apollo 14, Houston. We're standing by, your null bias reports.

SC Roger.

SC Okay. It will be about two minutes, Gordon. I had to restart it.

CAPCOM Roger.

PAO Apollo 14 now showing at an orbit of 168.6 nautical by 58.8 nautical miles.

END OF TAPE

SC Houston 14, (garble)

CAPCOM Go ahead.

SC Okay, minus 100 at the start, minus 99.4.

CAPCOM Roger, Ed.

PAO This is Apollo Control Houston. At 85 hours 16 minutes ground elapsed time. Conversation that has transpired thus far on the second revolution has been with - principally with command module pilot Stu Roosa and lunar module pilot Ed Mitchell and we have not heard from the commander Alan Shepard thus far this pass. We're at 85 hours 17 minutes into the flight and this is Apollo Control Houston, continuing to monitor.

END OF TAPE

APOLLO 14 MISSION COMMENTARY, 2/4/71 85:23 GET 250/1

PAO This is Apollo Control, Houston. At 85 hours 24 minutes ground elapsed time. Here's some preliminary numbers for the DOI or descent orbit insertion pad, which we do expect will be passed to the crew sometime during the front side pass. The burn is presently scheduled to occur at ground elapsed time of 86 hours 50 minutes 54.97 seconds, with a burn time of 20.77 seconds, and a Delta-V of 206.4 feet per second. At 85 hours 25 minutes ground elapsed time continuing to monitor, this is Apollo Control, Houston.

CAPCOM Apollo 14, Houston. I have the DOI and TEI size pads when you're ready to copy. Over.

SC Okay. Stand by one.

SC Okay, ready to copy.

CAPCOM Okay. I'll start with the DOI. SPS/G&N 38155 plus 145 minus 071 TIG is 086 50 5497 NOUN 81 minus 02064 minus all balls

END OF TAPE

CAPCOM ... 1, minus 02 064, minus all balls. Minus 00036. Attitude is 000 281 000, NOUN 24, 005 88. Plus 00091 02064, burn time 020.8, that 2.08. DELTA VC 01996, 11 1990 339 all the rest of the items on the pad are NA. Comments, GDC alines at the stars, Sirius on the zero degree mark, and Rigel. Sirius is star 15, Rigel 12. Our aline 127 148 015. All H four jets 147. Under comments, the DELTA V counter should read minus 6.7 at cutoff. Over.

SC (garble) DOI, SPS, (garble) 38 155 plus 145 minus 071 086 50 5497 minus 02064 minus all zips minus 00036 000281 000 00588 plus 00091 02064 020.8 01996 11 1990 339 the rest NA's Sirius on the zero degree line and Rigel 127 148 015 (garble) fourteen and the DELTA V counter should read minus 6.7 and cutoff.

CAPCOM Roger, Ed. The read back correct. I'm ready with the GES 5.

SC Okay proceed with the TDI 5 plan.

CAPCOM Roger. TDI 5 SPS/G&N. 36697, minus 063, plus 021, 092 30, 2001, NOUN 81 is plus 30235, plus 10915, minus 01712, 182, 107, 021. All H four jets 11 seconds. Under comments, number 1, burn is undocked, and number 2 assumed DOI. Go ahead.

CAPCOM Before you start your read back, Ed, a reminder to steal about 30 seconds now to (garble)

SC Okay, thank you, Gordon.

SC Okay, TDI 5 SPS/G&N 36697, minus 063, plus 021, 092 30 2001, NOUN 30235, plus 10915, minus 01712, 182, 107 021. Four jets 11 seconds. Under remarks, number 1 is undocked burn number 2 assumed DOI.

CAPCOM Roger, Ed, that's all correct.

PAO Apollo Control Houston.

CAPCOM I have one more comment for you.

SC Go ahead.

CAPCOM We noticed on the last burn when we played back the data that you started the recorder about 12 minutes prior to the burn. For this one, we'd like you to wait until about 1 minute prior to the burn to start the recorder so that we can get a quicker playback on the data for verification of the burn after AOS. Over.

SC Okay, we'll give it to you a little late.

CAPCOM Thank you.

PAO Apollo Control Houston. You heard CAPCOM Gordon Fullerton passing along the DOI and TEI on five pads. The TEI 5 pad is for contingency purposes only and it's stored within the spacecraft. We presently show Apollo 14 in an orbit of 168.4 nautical miles by 58.7 nautical miles. Assuming the descent orbit insertion burn would give us a resultant orbit of 58.8 nautical miles by 9.1 nautical miles. We're at 85 hours 42 minutes ground elapsed time and this is Apollo Control Houston.

END OF TAPE

PAO Apollo Control Houston. Not a great deal of conversation with the crew of Apollo 14 on this the second revolution. Reading the onboard DISKY shows the crew of Apollo 14 now performing a program 24. This is a optic tracking landmark tracking activity. Off their register they are now showing their shaft and trunnion angles. We'll stand by and continue to monitor in the event further conversation sues. We show a bit over 1 hour 5 minutes from scheduled time of ignition for the descent orbit insertion burn.

CAPCOM - time to start the DAC.

SC Roger. Go ahead.

CAPCOM And, you have about 10 seconds to G2.

SC Okay.

END OF TAPE

SC Houston, 14.
CAPCOM Go ahead, Ed.
SC The beautiful sight on the crater Eratosthenes, Timochans, Pallas. Timocharis is (garbled) is just over my horizon as we approach the terminator. Eratosthenes is about half way to the horizon. They're very stark (garbled)
CAPCOM Roger.
CAPCOM Stu, you're by T3 now. We'll send it by the magazine percentage.
SC Okay, stand by one.
SC Okay, Gordon. The magazine now reads 77 and just for info, I lost the landmark about 20 seconds earlier than what it shows. We got a good track on it. I lost the T1 plus 14. Want to take these?
CAPCOM Roger, Stu.
CAPCOM Understand 77 percent in mag Bravo.
SC That's affirmative.
SC Houston, 14.
CAPCOM Go ahead.
CAPCOM 14, Houston. Go ahead.
SC Houston, 14.
CAPCOM Roger, 14. We're reading you loud and clear. Go ahead, Stu.
SC Houston, 14.
CAPCOM 14, Houston. Loud and clear. Go ahead.
SC Gordon, how do you read? 14.
CAPCOM Stu, you're loud and clear. How do you read me?
SC Okay. You're 5 square. Is 060 still the roll attitude you want on this VERB 49 maneuver?
CAPCOM As far as I know. I'll recheck here.
CAPCOM That's affirmative. 060 roll, Stu.
SC Okay.
PAO This is Apollo Control, Houston at 86 hours ground elapsed time. Apollo 14 now on it's second revolution around the moon. For the descent orbit insertion burn the onboard computer program 40 will be used as this is the service propulsion system thrust program. We expect to see 14 - the crew of 14 start into that program sequence and maneuver to burn attitude before they pass out of range on this revolution. The burn, of course, will be done at 86 hours 50 minutes 54 seconds when the spacecraft is out of contact with Mission Control. At time of ignition minus 30 seconds the onboard computer starts counting down to the burn at TIG minus 5 seconds the proceed button must be pushed probably by spacecraft commander Al Shepard for the count-down to continue. Otherwise, the maneuver will not be

PAO accomplished. We're at 86 hours 2 minutes ground elapsed time. We show our Mission Control clock at - we're 48 minutes 48 seconds from time of ignition. And this is Apollo Control, Houston.

END OF TAPE

SC Houston, 14. I have you on the high gain.
CAPCOM 14, Houston. Go ahead.
SC Roger. I have you on the high gain locked up.
CAPCOM I hear loud and clear.
PAO Our displays showing the computer readouts from the spacecraft show that Apollo 14 is now in the process of alining the guidance and navigation platform. We're at 86 hours 9 minutes ground elapsed time. And, Apollo 14 presently in a orbit of 168.4 nautical miles apolune 58.7 nautical miles perilune. Present altitude 142.1 nautical miles.
SC Okay, Houston. P52 complete. Did you get the torque and angle?
CAPCOM That's affirmative, Stu. And,
SC At the time was 861.
SC At the time was 861015.
CAPCOM Roger. And, if you'll give us P00 and ACCEPT we'll give you a new stay vector and a target load.
SC Okay, you've got it.
CAPCOM Roger.
CAPCOM Apollo 14, Houston.
SC Go ahead.
CAPCOM The computers yours and we stand by to watch P30 and P40. We noticed on the high gain that the signals are just a little different. Did you change any configuration on the COM or did you change position of your squelch on the last high gain apposition. Over.
SC You know, Bruce, over at standard lunar com and I don't know if we've done anything differently.
CAPCOM Okay, Ed.
SC We could recheck everything, but it'd take a minute.
SC 14.
CAPCOM Go ahead, Ed.
SC All the concerts are just where they were set on the back side. Nothing's been changed except the fine with the high gain. I did switch the squelch and able when we were on OMNI and I was looking for you for a good OMNI to reach the maneuver.
CAPCOM Roger, Ed.
PAO Apollo Control, Houston. 86 hours 17 minutes ground elapsed time. Our display show the onboard computer for the display keyboard just switching from program 30 this is the external Delta-V program, prethrusting program. to program 40 which is the service propulsion system, engine program. This is a program in which the crew of Apollo 14 will perform the descent orbit insertion burn. We've got a little over 11 minutes before we loose signal with Apollo 14 as it passes over the backside of the Moon. 86 hours 18 minutes into the flight, this is Apollo Control Houston.

PAO And, Mission Control Flight Director Pete Frank now taking a status from members of his flight control team for a GO NO/GO for DOI. We'll stand by. Presently coming up all greens on his console. Fullerton will pass along a GO momentarily.

CAPCOM 14, Houston. You are go for DOI.

SC Okay. Go for DOI, thank you.

PAO Spacecraft to Commander Alan Shepard responding to that call. Apollo 14 now go for DOI. We're at 86 hours 20 minutes ground elapsed time. And, this is Apollo Control, Houston.

PAO Apollo Control, Houston, 86 hours 26 minutes ground elapsed time. We show a little over 3 minutes from time of loss of signal. As Apollo 14 now close to passing out of range on this the second revolution.

END OF TAPE

CAPCOM Apollo 14, Houston, give us omni, Charlie?

CAPCOM Apollo 14, Houston.

SC Okay, Houston, there you are, go ahead.

CAPCOM Okay, read you loud and clear, Ed, and about 2 minutes to LOS, 1 minute 45, now.

SC Okay.

PAO Less than 1 minute now from Loss of Signal. Our clock in Mission Control shows time of ignition now 22 minutes 30 seconds away. Ground elapsed time 86 hours 29 minutes. This is Apollo Control Houston.

PAO This is Apollo Control Houston. We've had Loss of Signal with Apollo 14 as it - now passing over the back side of the Moon. On this pass the descent orbit insertion burn will be performed near perilune. The command service module DOI burn is preformed with the service propulsion system engine and this with the spacecraft at an essentially retrograde atitude and the crew heads down. Following the DOI burn the vehicle is maneuvered to the required attitude for a possible preplanned continency burn called the bail out burn. Initial burn atitude is such that the vehicle is pitched up some 73 degrees above the local horizontal. At the bail out burn time - the bail out burn time, this is at acquisition of signal plus 12 minutes. Assuming the likelihood that the bail out burn will not be required, the command and service module is maneuvered to an atitude which allows the visual observation of landmark, H3, with the optics. As you would expect, the bail out burn is one case where the mission control centers' fondest hope is to get no go for the maneuver. We're at 86 hours 31 minutes into the flight and this is Apollo Control Houston.

aEND OF TAPE

PAO Apollo Control Houston, 86 hours 50 minutes ground elapsed time. Our ignition clock in mission control shows 50 seconds away from scheduled time of ignition for the descent orbit insertion burn. This burn scheduled with a ground elapsed time of 86 hours 50 minutes 55 seconds. And if successful, placing Apollo 14 in an orbit approximately 58.8 nautical miles by 9.1 nautical miles. We show 20 seconds away. 10 seconds, 5, we should be burning at this time if going according to plan. The ground elapsed clock now reads 86 hours 51 minutes into the flight of Apollo 14. In the mission control center the ignition clock will shortly be switched to a second AOS clock giving - with these two clocks, the top one assuming a no burn early acquisition of signal, the bottom one an on time burn. The clocks have now been switched. 86 hours 52 minutes ground elapsed time this is Apollo Control Houston.

END OF TAPE

PAO Apollo Control, Houston. 87 hours 12 minutes into the flight of Apollo 14. Our countdown clocks in Mission Control, the no burn clock 45 seconds away now, continuing to count. On our own time burn clock we show 3 minutes 9 seconds away. We'll stand by and watch as we draw closer to the time of acquisition. 87 hours 12 minutes ground elapsed time. This is Apollo Control, Houston.

PAO We've passed the early time and continuing to count. Our own time countdown clock shows 2 minutes 18 seconds away from acquisition. Meanwhile, in Mission Control, a larger than usual turnout for this hour. In the viewing room is Acting Administrator of NASA, George Low, Manned Spacecraft Center Director, Dr. Robert R. Gilruth, and on the control room floor the backup crew of Apollo 14, backup commander Gene Cernan, Ron Evans, backup command module pilot, Joe Engle backup lunar module pilot, Rocco Petrone, director of the Apollo Program, Chris Craft, deputy director of the Manned Spacecraft Center, Sig Sjoberg, director of flight operations, Astronaut Chief Tom Stafford, and director of flight operations, Deke Slayton. They're all here. Just a little over a minute away now from scheduled time of acquisition. This is Apollo Control, Houston, standing by.

PAO 30 seconds away now. Also in the viewing room, Dale Myers, associated administrator of NASA from Manned Space Flight and Dr. John Clark director of Goddard Space Flight Center.

PAO 10 seconds away now. Standing by, this is Apollo Control, Houston.

PAO We have acquisition.

CAPCOM 14, Houston. Over.

SC Houston, Apollo 14.

CAPCOM Loud and clear, Al. A lot of people standing by to hear how it went.

SC Okay. The burn went essentially normally. Burn time was 20.6 seconds with the ball and residuals on the G&N shutdown. Plus 0.6, plus 0.2, zero, delta Vc minus 6.2. With me?

CAPCOM Roger. Copy. Burn time 20.6, a plus .6, plus .2, and zero and delta Vc minus 6.2.

SC That is correct. Fuel 31.7, oxidizer 31.4, unbalanced decrease 90.

CAPCOM Roger, Al. And 14, Houston, we'd like you to go to POO please.

SC Okay. POO.

CAPCOM Thank you. We'll have a look at the VG.

SC Do you want ACCEPT?

CAPCOM Negative.

SC Okay. And CMC orbit was okay. And CMC orbit was 10.4 by 58.8.

CAPCOM Roger.

PAO Onboard orbit reading reported by Al Shepard 10.4 nautical miles by 58.4 nautical miles. Earlier reported by spacecraft commander Shepard a burn time of 20.6 seconds. We're at 87 hours 18 minutes ground elapsed time.

CAPCOM 14, Houston. The computer is yours.

SC Okay.

PAO Apollo Control, Houston. The first radar data solutions say Apollo 14 has a good orbit. We'll stand by continue to monitor. We're at 87 hours 22 minutes ground elapsed time.

PAO MSFN data says we're stay.

CAPCOM 14, Houston. You have a stay. We're still evaluating the orbit to give you the precise numbers. Over.

SC Good show. That sounds good to us. We're here.

SC We all thank you.

SC And Gordon, are we clear to start our maneuver then?

CAPCOM That's affirmative.

PAO That exuberiant response coming from Al Shapard. Then lunar module pilor, Ed Mitchell, joining in. We're at 87 hours 24 minutes ground elapsed time. This is Apollo Control, Houston.

PAO Apollo Control, Houston. Ground elapsed time of 87 hours 26 minutes. A preliminary look at the data here on the ground shows an orbit of 59 nautical miles by 9.3 nautical miles.

CAPCOM Apollo 14, Houston.

SC Go ahead, Houston.

CAPCOM We've got you in on 9.3 by 59.0.

SC Okay. Sounds pretty good. 9.3 by 59.0.

CAPCOM Roger.

SC I guess we could make it down from here tomorrow.

CAPCOM Roger.

PAO Apollo Control, Houston. 87 hours 29 minutes ground elapsed time. We repeat that it appears Apollo 14 had a good DOI burn. Ground data shows an orbit of 59 nautical miles by 9.3 nautical miles. Apollo 14 is stay in this orbit. DOI was planned for Apollo 13, but, of course, not used. Therefore, command module pilot, Stu Roosa, has decended closer to the lunar surface than any

PAO other previous Apollo crewmembers occupying his seat. 87 hours 30 minutes, this is Apollo Control, Houston.

END OF TAPE

SC Houston, 14.

CAPCOM Go ahead, Ed, you're just starting (garble)

SC Houston, 14.

CAPCOM Roger, Ed, go ahead.

SC Okay, now for the first time we saw an earthrise over the LM, we're sighting at you along the right hand providing rendezvous window and it's a beautiful sight to see the Earth from here. And you are just a bit over the LM, number 4 quad, no, number 1 quad.

CAPCOM Roger.

SC Houston, 14.

CAPCOM Go ahead, Ed.

SC Looks like we're getting mighty low here. It's a fairly different sight from the higher altitudes. We're coming across the - we're just now over the crater Gutenberg at this point it's at my back window.

CAPCOM Roger, we're following your course on the map here.

SC Those (garble) mountains look like they have a nice soft blanket on from this altitude. They look very harsh, but the (garble) looks smoother and more (garble) than angular and sharp.

CAPCOM Roger.

SC (garble) inside the crater Isidorius at this point and we're trying to follow it on the smaller chart.

CAPCOM Roger.

END OF TAPE

CAPCOM Apollo 14, Houston, over.

SC Go ahead, Houston.

CAPCOM In about 4 minutes you'll be at your minimum altitude, which should be about 40 000 feet above the terrain. We were wondering how things look down there.

SC Well, I'm glad to hear you say we're that high. It looks like we're quite a bit lower as a matter of fact we're below some of the peaks on the horizon, but that's only an illusion.

CAPCOM Roger.

SC The surface appears to be a lot smoother down here where we can see closer to the detail and particularly at this higher sun angle it appears to be a softer surface, but it certainly is an unusual sensation flying this low.

CAPCOM Roger.

SC Houston, it looks like that I'm looking right up the (garble) rille by the crater Hipparchus. The country down here is really rugged at this altitude. The rill looks like to be a drop that had been dropped down 10 000 feet. It was just another map.

CAPCOM Roger, Ed.

CAPCOM Stu, you're about 25 seconds from picking up H3.

SC Okay, thank you. I'm looking.

END OF TAPE

SC Okay. Thank you. I'm looking.

SC This scale is so deceiving. We could be 500 feet in the air the way this terrain looks (garbled)

CAPCOM Roger.

SC I'm looking down inside the crater Mosting.

CAPCOM Roger. And steer your GTA minus 20 seconds now.

SC The Mosting is a big crater with an almost vertical drop of the east side of it. More than that we can know from the west side. And it looks like solid rock on both sides. And, soft regolith near (garbled)

CAPCOM Roger.

SC Okay, Gordon, how do you read.

CAPCOM Loud and clear, Stu.

SC Okay. Well that turned out to be a piece of cake. That very low angle Ed located by coming off of points B and BA. And about 515 5110 on this block. The elevator angle was enough so that I could pick up a streak. And, just for your info, using high speed I could track it just smooth as glass, all the way through even though we're in inertial attitude. And, it looks relatively easy I think 14-2 ought to really be a piece of cake.

CAPCOM Sounds good.

SC Gordon, the optics, even at this low altitude, tracking the landmarks is rather phenomenal. You can keep it right on there at high speed, just as smooth.

CAPCOM Roger, Stu.

CAPCOM Stu, Ron's here with me. He was curious about how good the initial 20 accuracy of the optics is, over.

SC Okay. Well, it, I think it was right on the money. When they first came up, it was pretty bright, and the background release on 83, that ridge right behind it, did not show out on the flat surface, as much as I would have hoped. Of course, I've got the LM there too. I couldn't pick it up until the trunnion got down to about 31 or 32 degrees. The objects were right in the area. I think they were a little high. But, I came off like I say off of Mosting B and BA, and got ... I picked it up at a fairly low elevation, I believe. And, we came upon them a little bit why we're right there. And, then I tracked them with the high speed. I never gave them back the (garbled)

CAPCOM Roger.

PAO Apollo Control Houston. The ground elapsed time 87 hours 56 minutes. Again predicted versus actual times were close. We predicted that GET for the descent orbit insertion of 86 hours 50 minutes 54.97 seconds. The actual time for ignition 86 hours 50 minutes 54.97 seconds. Delta-V predicted was 206.4 feet per second. Delta-V actual as logged by our Flight Dynamics Officer 205.7 feet per second. The burn time predicted 20.8 seconds. Actual 20.7 seconds.

PAO We're advised that the highest mountain near pericynthion is at 7.6 degrees east and has an elevation of 2.9 nautical miles. We're up to 87 hours 57 minutes into the flight. Our displays now show Apollo -

CAPCOM This is Houston. I have a map update for you, REV 4.

SC Okay. Go ahead.

CAPCOM Roger, the 180 is 884655. LOS and AOS are within a minute. Over.

SC Okay. LOS and AOS within a minute, and the 180 is 884655.

CAPCOM That's correct.

SC Houston, Houston, 14.

CAPCOM Go ahead.

SC Okay, Gordon. Ed was out being dark adapted. Just coming off with my eye glued on the optics coming across the Sun. You can see a very definite horizon through the optics here in earthshine. And, can pick out the rims of the bright craters and some craters do have bright rims on them. And, I'm sure if you were really dark adapted you could see quite a bit through the optic scanners.

CAPCOM Roger, Stu. That's interesting.

SC Of course with the naked eye you can see excellent horizon in Earthshine. I'm looking for example, to the south and have a very clear horizon.

CAPCOM Roger, out.

END OF TAPE

SC Houston, looking to the north we can see the same view, a very sharply defined horizon, I can see the stars. I got a very soft grey, well lit surface below without too many features you can't see sharply, not distincly, but nothing's probably lost.

CAPCOM Roger.

PAO Apollo Control Houston, 88 hours ground elapsed time. Our latest data shows Apollo 14 with an apolune of 58.8 nautical miles perilune 9.6 nautical miles.

SC Okay, Gordon, the angles were torqued at 8805 and I guess you got them.

CAPCOM Roger, 8805 we got them.

CAPCOM Apollo 14, Houston.

SC Go ahead, Houston.

CAPCOM We'd like a word from you on whether or not you indeed got a guided shutdown on the DOI burn or whether you think you might have beat it slightly, over.

SC I thought I made that clear when I gave you the burn report on the G and N shutdown. The DELTA-V switches were turned very definately after the cutoff of the G and N.

CAPCOM Okay, Al.

SC Your people eyeball, whereas you guys have eyeballs watching us very carefully.

CAPCOM Roger, Al, thank you.

SC Hey, Gordon, I'd say the PC was following through about - at a maximum of about 25 when I moved the switches.

CAPCOM Roger.

END OF TAPE

CAPCOM Roger.

PAO Apollo Control Houston at 88 hours 18 minutes ground elapsed time. We show just a little over 2 minutes away now from loss of signal with Apollo 14, as Apollo 14 will pass over the back side of the moon.

CAPCOM Apollo 14, Houston.

SC Go ahead, Houston.

END OF TAPE

CAPCOM 14, Houston

SC Go ahead, Houston.

CAPCOM About a minute to go to LOS and one final reminder for Stu as he sets up the topo camera, don't forget to pull the pit pin.

SC Okay. Oh, ye of little faith, but no sweat. I'll remind him.

CAPCOM Okay.

PAO Apollo Control, Houston. 88 hours 21 minutes into the flight. We've had loss of signal with Apollo 14. As the spacecraft now passing over the far side of the moon on this the third revolution. This is Apollo Control, Houston.

END OF TAPE

PAO Apollo Control Houston at 89 hours 8 minutes GET, we show that we're less than a minute away now from re-acquiring Apollo 14. We'll standby.

SC This is Apollo 14, do you read.

CAPCOM Apollo 14, Houston. Go ahead.

SC Roger. Read you loud and clear.

CAPCOM You're loud and clear Ed. And -

SC We're standing by to copy map up-date and (garbled).

CAPCOM Okay, You're way ahead of me, map update for rev ten, 180 is one zero zero zero 952. The LOS and AOS are within a minute, over.

SC Okay.

SC Okay Gordon, we've got that, 1000952.

CAPCOM Okay Stu, and the LTC photopath Target 9, (Decartes). I guess we gave you a new attitude sometime ago and we're going to change it slightly to the latest version, that's roll 344 pitch 145, and yaw 350. T-start is 089 34 36. T-stop is 89 40 41, and I read six ranges going down the line, first one is 53.9, 55.2, 47.7, 40.7, 38.0, 34.9. Over.

SC Okay Gordon, reading roll pitch yaw 344 145, 350. T-start 089 34 36. T-stop 089 40 41. Ranges 53.9, 55.2, 47.7, 40.7, 38.0, and 34.9.

CAPCOM Okay Stu, readback is correct, I have a TEI 12 pad when somebody's ready.

SC Go with TEI 12.

CAPCOM Okay, we have a state vector. Would like poo and accept when you can give it to us, for that.

SC You got it.

CAPCOM Roger. Okay, TEI 12. SPS bias G and N, 367 02. minus 062. Plus 021, tig is 105 53 44 96 981 plus 34 243 plus 11763 minus 02166 181 095 020. Ullage is 4 jets, 11 seconds. Remarks, burn undocked and number 2 is assumes no circ. Over.

SC Roger Gordon, the TEI 12. SPS G and N 367 02. Minus 062. Plus 021, 105 53 44 96 Plus 34 243 Plus 11763, minus 02166 181 095 020. 4 jet 11. Burn undocked and assumes no circ burn.

CAPCOM Roger Ed, you'd make a good stenographer, the readback's correct.

SC Thank you. Buzz told me I don't have the looks for it.

CAPCOM Rog.

PAO Apollo Control Houston. 89 hours 16 minutes GET. The LTC is the Hycon lunar topography camera. Descartes, which will be the subject for this up-coming photographic exercise, is a strong candidate for a future Apollo mission.

CAPCOM It's your computer.

SC Okay, we got it.

PAO Apollo Control Houston, 89 hours 18 minutes GET. Our display presently shows Apollo 14 at an altitude of 28.7 nautical miles with an apolune of 59.1 nautical miles, a perilune of 9.2 nautical miles. This is Apollo Control Houston.

PAO Apollo Control Houston. 89 hours 31 minutes now into the flight - literally no contact with the crew on this front side pass except for the very beginning. This is the fourth revolution around the moon. Stu Roosa undoubtedly quite busy with the lunar topography camera. The LTC is mounted in the crew access hatch window. And in earth weight weighs 65 pounds.

CAPCOM Now one minute to T start, Stu.

SC Rog. Power's on, man you got that lead time in just right, Gordon, for the transmission delay.

CAPCOM Rog.

SC And she's running.

CAPCOM Roger.

PAO Apollo Control Houston, GET of 89 hours 35 minutes. We presently show Apollo 14 at an altitude of 10.9 nautical miles above the earth, moving toward the perilune.

CAPCOM (Garbled)

PAO 14's present orbit reads 58.9 nautical miles by 9.1 nautical miles, now traveling at a speed of about 5548 feet per second.

SC Range 47 7.

END OF TAPE

SC 440.7.

PAO 14 presently at an altitude of 10.1 nautical miles above the moon; ground elapsed time 89 hours 37 minutes. Ground elapsed time 89 hours 38 minutes. 14 now 9.7 nautical miles above the moon; perilune, 9.1 nautical miles.

CAPCOM Change your range to 38.0. Change your range to 34.9.

PAO 89 hours and 40 minutes ground elapsed time. 14 at 2 minutes away from reaching the low point of its flight plath over the moon.

SC Okay, Gordon, we got them. Let me write down something here and I'll talk to you about it.

CAPCOM Okay.

PAO That's Stu Roosa talking back and forth with capsule communicator Gordon Fullerton.

SC Back there, Gordon, we took up and changed the range of the - by the time times lifted your call, but there was some strange noises coming out of the magazine. Both spools worked and the frame counter ran and the FMC worked, but there was sort of a clacking noise on the - in the magazine. It came on between frames 140 and 180 then went back to the normal mode and then started again at frame 240 and went until the end of the film path and reading 420 on the counter was reading 5 when I started. I used 5 for the checkout.

CAPCOM Okay, Stu. there was no change in the operation on them. It looked like it was taking the pictures okay. Just the funny noise. Is that all?

SC Yeah. It didn't - it looked like it was going alright. Like I say the film wound up and the FMC continued to work. However, when I went to standby at the end, the FMC kept trying to drive and now with the mode switch at standby and I've turned the power on instead of just getting the one slap over to the side of the FMC like you do normally, and it wants to keep driving.

CAPCOM Okay. Before you fold it up -

SC Belay that, Gordon. It doesn't - FMC does not keep driving, but that noise is still in there. Maybe you can hear it here. I'll hold the mike down. Okay, I don't know if you can get anything out of that or not, but that's with the - mode switch in standby and the power on, and during that period of time the FMC kicked a couple of times. It initially went off to the side like it does when you apply the power and then during that period of time that I had the transmitter down, the FMC did work twice with the mode switch in standby and power switch on.

CAPCOM Okay, Stu. Before you fold it all up, if it doesn't get in the way there, why don't you let me check with the back room and see if there's anything they want you

CAPCOM to - else they want you to look at there, and I'll get back with you.

SC Okay, and another word here with the - it did - Like I - it worked normally up until about frame 140, but now when I turn the power on mode standby you get that clacking sound and intermittently the FMC kicks and the frame counter moves when we take a picture.

CAPCOM Rog. I understand that. It happens in standby.

SC That's affirmed. I am getting a great look at my low altitude landmarks, Gordon, from this low pass here.

CAPCOM Roger, Stu.

SC Couldn't even attempt to describe this, we're passing over it so rapidly. There's so much here to talk about.

CAPCOM Okay, Ed.

PAO 89 hours 49 minutes. You heard that last report from Ed Mitchell. We presently show Apollo 14 at an altitude of 11.2 nautical miles above the moon.

SC Houston, 14.

CAPCOM Go ahead, Stu.

SC Okay, I'm going to go ahead and maneuver to the rest attitude, if you're agreeable.

CAPCOM Stand by. I'll check to be sure it's okay with everybody. Okay, Stu, you have a go to maneuver.

SC Okay.

PAO Apollo 14 now maneuvering to the rest attitude following command module pilot Stu Roosa's request, which was certainly concurred upon here in Mission Control. The work day for 14 - the crew of Apollo 14 now essentially over. Coming up just ahead will be a breakfast period and then a rest period of some 8-1/2 hours prior to tomorrow's very busy schedule.

CAPCOM Stu, this is Houston.

SC Go ahead.

CAPCOM this is probably a - it's probably something you would have mentioned earlier, but we were wondering if there was any hint of that clacking noise on the other magazine that you checked out on translunar coast, or was this the magazine that you used to check out on translunar coast. I guess I can look that up myself. Over.

SC Well, to answer your questions, no, there was no sound like this. I never heard this on any training camera. It was not on the checkout during translunar coast. It was not on this camera - I mean on this magazine during the checkout. It did not start until approximately frame 140. It stopped at frame 180, then went back to what appeared to be normal, and then started again on frame 240 and stayed on until the end of the paths when I was reading frame number 420.

CAPCOM Okay. Right. We've got all that copied

CAPCOM and we're still waiting on some kind of response from the experts here. So we'll give you a call when they come back to us.

SC Okay. I'd just like to verify that it appears, you know, that the film wound all right. The frame counter moved and the - both the speed and the take-up spools were turning and if it's any problem, it would have been, I suspect, in the FMC. Well, now, it shouldn't have been in there. It's got to be in the magazine. I don't really know. I'm going to let you all worry about that one, I guess. But the - it appeared that the film went through all right.

CAPCOM Okay. We'll get back with you.

SC Okay.

PAO Apollo Control, Houston, 90 hours of ground elapsed time. Pete Frank advising this flight control team. We're 20 minutes until LOS, with the rest period coming up. He wants to check around the room and see if anybody has anything that should be brought up with Shepard, or Roosa and Mitchell, prior to their eating and going to sleep. The eat period will be scheduled during their pass over the far side of the moon. 90 hours 01 minute continuing to monitor. This is Apollo Control, Houston.

END OF TAPE

SC And Houston, 14. I've got some onboard readout.

CAPCOM Okay, 14, I'm sorry I was tied up there go ahead with your readout.

SC Okay. BATT C 37.0, PYRO A 37.2, PYRO B 37.2, rcs able 80. Baker 82, Charlie 80, Dog 83.

CAPCOM Okay, Stu. Got all those and get a suggested checkout procedure for the LTC here.

SC Okay. Go ahead.

CAPCOM Okay. Talked to Dale Denais he thinks that it's most likely something wrong in the magazine there, and it could either be a gear train or a clutch in there that could be making and breaking. He suggests that you get out magazine lifter once again and put it on there and leave it in standby a while and verify that it doesn't cycle or the DSMC doesn't sweep and if that looks okay, then go ahead and run off two or three frames and see if it appears normal.

SC Okay. I need to put that one on anyway. I'll put on magazine V and I'll turn the power on and put it in standby and see how it acts and then run off two or three frames and along that line this magazine you know was in standby for a minute there, you know, with the power on prior to start and we got no noises. And, I agree with the diagnosis there it's - I'm sure it's in the magazine, or relatively sure it sounded like it , it felt like it and it did feel like something like a clutch slipping on the thing.

CAPCOM Okay. I hope we got the pictures anyway and let us know how the other one works.

SC Okay. I'll smoke on through that and give you a call.

PAO Apollo Control. 90 hours, 10 minutes ground elapsed time. Two members of the Apollo 15 crew in Mission Control now, looking over Pete Franks shoulder. That's Dave Scott, the Commander for Apollo 15 and Al Worden who will be quite busy with photography himself as Command Module Pilot for that mission.

CAPCOM Apollo 14, Houston. Would you give us an EMOD before LOS here in about 7-1/2 minutes to go.

SC Okay. Do you want it right now?

CAPCOM Okay, we are ready.

SC Okay. Give it to you now, Gordon.

SC Okay, coming down.

SC 14, Houston.

CAPCOM Go ahead. Apollo 14, Houston. Go ahead.

PAO Apollo Control, Houston. 90 hours, 22 minutes we've had loss of signal with Apollo 14. The spacecraft now passing above the backside of the moon. Our display presently shows an orbit of 59 nautical miles apolune 9 nautical miles perilune. 90 hours, 23 minutes. This is Apollo Control, Houston.

END OF TAPE

PAO Apollo Control Houston, 91 hours 02 minutes GET time for the flight of Apollo 14. We show we're 10 seconds away from time of acquisition of the spacecraft. We'll stand by.

PAO We are now receiving data.

CAPCOM 14, Houston.

SC Go ahead Houston, 14.

CAPCOM Okay, Stu, you're loud and clear. That early AOS on the last REV was on mistake. We were mislead by a mis-set clock here in the control room. How did the LTC look to you after you tried the new magazine?

SC Well, I tell you what, we ended up with the same trouble let me run through and tell you what it is. Let me get the flight plan out here.

CAPCOM Okay.

SC Okay, I put MAG B on the camera and I ran it in stand by for about 2 and a half minutes and everything worked fine. I then went, shot 3 frames at about, at with intervalmeter set on 10 and it worked fine, and then I thought that maybe its the fast frame rate so I put it on 65 and shut off 5 or 6 and it worked okay. Then I went to stand by and then on to single frame and punched the single frame and got the same noise. And then it started, the magazine started actuating in stand by with the power on, so I turned the power off, ran the intervalmeter back down to 10, turned the power back on, still had the noise, and the magazine appears to follow the intervalemeter setting but it may do this on a random fashion while in stand-by and it does move the film or at least the both spools move and the counter moves. And it had that same clacking sound, not really a clacking sound but I guess its kind of hard to describe. Maybe thats as good a term as any, and so I turned the magazine off, by this time I had shot 20, 23 frames and decided that was enough film to waste. I really didn't mean to use that many but I was trying to check out that 65 per minute intervalmeter setting.

CAPCOM Okay, Stu, thats a good summary of what you did. Personally I am more mystified than before and we'll let them work on that some more.

SC Okay, I guess in summary, we got the same problem with both magazines now. Maybe the film is working alright, maybe we are just getting, getting a strange noise in there on the gears or the clutch as you suggested, but we have ended up now with both magazines having the same symptom.

CAPCOM Roger understand. We'll think about it while you are sleeping I guess and maybe have some fresh ideas in the morning. For you general information the pericynthian was slightly high but it seems to be coming

CAPCOM down faster than we anticipated it would with each REV, but the results at PDI time we ought to be right on the money as near as we can tell. So pretty good works on that point.

SC Okay, that sounds real good, I guess I, I was a little suprised at the point 6 residual from the G an N, you know the inpulse burn was a little lower than that but I guess somebody, it doesn't bother anybody, and yea it looked like a great burn to us and it sounds like good news about being right there for PDI.

CAPCOM Okay, and one thing for Ed, his bio sensor seems to be acting up. We would like at his convenience some time before suiting up tomorrow to go through the same sort of checkout that Al did earlier in the flight, on his sensors, over.

SC Okay, I'll pass that on to Ed.

CAPCOM Okay, thats all I have on my list at the moment, over.

SC Okay, I guess we've got nothing else here, we're going to try to get secured for the big day tomorrow, and we'll be seeing you in the morning.

CAPCOM Okay, I'll make one check to make sure we haven't got anything else before we shut up and let you get some sleep.

SC Okay.

CAPCOM Okay, Stu, one other thing. We did get that E mode before we went AOS, okay, and I guess, wait I was just thinking there is one more thing. Stand by. Okay, we would like you to turn the optics off tonight. That should do it. Get a good rest there. Over.

SC Roger, we'll get the optics off before we go to sleep and we've been doing that, and yea, I guess if you've got any other questions on that, on the high com, I'd entertain them now to help you with the trouble shooting but that's about it. We'll see you tomorrow.

CAPCOM Okay, good night.

PAO Apollo Control Houston. 91 hours 09 minutes into the flight of Apollo 14. That was Stu Roosa signing off for the evening, on behalf of the crew of Apollo 14. We presently show 14 in an orbit around the moon of 59.2 nautical miles apolune, paralune 9 nautical miles. We are at 91 hours 10 minutes, we do not expect to contact the crew any further during this front side pass, but we'll stand by an continue to monitor in the event that we do. This is Apollo Control Houston.

END OF TAPE

PAO This is Apollo Control Houston, at 91 hours 39 minutes and now reading in GET. We're less than 30 minutes away now from LOS with the Apollo 14 spacecraft. The crew of Apollo 14, Al Shepard, Ed Mitchell Stu Roosaa now in a rest period. We do not expect to hear from them for the balance of our front side pass. We presently show 14 in an orbit of 59.2 nautical miles by 9 nautical miles, and we have an announcement to make: Mr. Camillio Ripamonti, the Italian Minister for Science and Technology, will hold a news conference at 2 p.m. this afternoon in the News Center Briefing Room. That's at 2 p.m. this afternoon at the News Center Briefing Room. We're at 91 hours 40 minutes into the flight and this is Apollo Control Houston.

PAO This is Apollo Control Houston 51 hours - or 91 hours 51 minutes GET, we presently show Apollo 14 in an orbit of 59 nautical miles by 8.9 nautical miles. The surgeon advises that they're monitoring command module pilot Stu Roosa at this time. Their indications are that Roosa's probably still awake, certainly relaxing. We show Apollo 14 traveling at a speed of 5505 feet per second. It's present altitude above the moon 18.2 nautical miles. This is Apollo Control Houston.

PAO Apollo Control Houston. We're coming up now on the LOS with the spacecraft on this the fifth revolution. Network reports we've just had loss of signal, we'll take down the line at this time. We're at 92 hours 8 minutes into the flight and this is Apollo Control Houston.

END OF TAPE

PAO This is Apollo Control Houston. We have an announcement. There will be a change of shift news conference following the handover of flight control teams. The Maroon Team will be coming aboard to replace the Orange Team. The shift change is scheduled for 11:30 a.m. Participants in the conference will be Flight Director Pete Frank and Cap Com Gordon Fullerton. This will be following the handover presently scheduled for 11:30 a.m. This is Apollo Control Houston.

END OF TAPE

PAO This is Apollo Control Houston at 92 hours 55 minutes GET time. We're less than a minute away now from reacquiring the space craft as it will be passing over the front side of the moon on its 6th revolution. The crew of Apollo 14 presently enjoying a rest period. We have no plans to contact the spacecraft, however, we will keep the line open in the eventuality that we receive a call from one of the crew, members of the crew. Less than 15 seconds away from projected time of acquisition. We'll stand by an continue to monitor. Network advises that we have acquired data. Apollo 14 now passing over the front side of the moon. And in the mission control center, flight director Milt Windler now on station along with members of his Maroon team of flight controllers. 92 hours 57 minutes into the flight this is Apollo Control Houston.

END OF TAPE

APOLLO 14 MISSION COMMENTARY, 2-4-71, 1124 CST, 93:01 GET, MC-271/1

PAO This is Apollo Control at 93 hours, 22 minutes. We have a little over 6 hours remaining in the current crew rest period. At the present time Apollo 14 is at an altitude of about 11 nautical miles above the lunar surface moving down towards pericynthion of 8.8 nautical miles. The current apocynthion that we;re reading is 59.4 nautical miles. There will be a change of shift press briefing shortly in the MSC news center briefing room. The participants in the briefing will be Flight Director, Pete Frank, and CAPCOM, Gordon Fullerton. Flight Director, Milton Windler has completed recently and are going around the room checking the status of the mission and the spacecraft with each of his flight controllers. The reports are coming back in all cases that the mission is proceeding smoothly and no problems with the spacecraft or the mission at this point. At 93 hours, 23 minutes this is Apollo Control, Houston, standing by.

END OF TAPE

PAO This is Apollo Control at 93 hours 49 minutes. We have about five hours 40 minutes left in this crew rest period. Stu Roosa has the watch in the spacecraft, and is the only crew man on whom we have a biomatical data, and that is in and out as we get high bit rate. But the surgeon reports that at the last look it appears that Stu Roosa was sleeping. Well, we have about 12 minutes remaining before we lose contact again with the spacecraft as it goes behind the moon on the sixth revolution. And our data on the command module at the present time shows the cabin temperature holding right around 70 degrees, cabin pressure of about 5.2 pounds per square inch, which is normal in both respects. At 93 hours 50 minutes, this is Apollo Control standing by.

END OF TAPE

PAO This is Apollo Control at 94 hours 01 minute. We are about to lose acquisition with the space craft now, and flight director Milton Windler has just gone around the room to get a final status check before loss of signal, and every thing looks good at this time. The crew has about 5 and a half hours remaining in their rest period, and when next we acquire Apollo 14, it will be on their 7th revolution of the moon. And our communications officer reports we have loss of signal now and will be reacquiring the space craft in about 45 minutes. At 94 hours 02 minutes, this is Apollo Control Houston.

END OF TAPE

APOLLO 14 MISSION COMMENTARY,2/4/71, 1313 CST,94:50 GET,MC-274/1

PAO This is Apollo Control at 94 hours 51 minutes. We're standing by now to reacquire Apollo 14 on its seventh revolution of the moon. Network reports that we have - just had acquisition. The crew has about four and a half hours remaining in their rest period and we do not expect any conversation with the spacecraft during this front side pass on the moon. However, we will keep the circuits up live in the event that we get any conversation with the spacecraft. We're presently showing Apollo 14 at an altitude of 40.7 nautical miles above the moon, and we're reading an apocynphion of 59.3 nautical miles and a pericynthion or a low point of 8.8. There's been virtually no conversation on the loops here in Mission Control. Shortly after the spacecraft passed behind the moon on the last revolution, Flight Director Milton Wendler advised his flight controllers that he would like to review procedures for the ascent which this ship will have - the lift off from the moon during the next back-side pass. When the spacecraft is out of communications with earth. At 94 hours 52 minutes this is Apollo Control Houston standing by.

END OF TAPE

PAO This is Apollo Control at 95 hours 47 minutes. We now have 3 hours 43 minutes remaining in the crew rest period, and it continues to be very quiet here in mission control. We'll lose contact with the spacecraft in about 9 minutes on this the 7th revolution. The Italian minister for science and technology, Camillio Ripamonti, will meet with news men in the MSC news center briefing room at this time. At 95 hours 47 minutes, this is Apollo Control Houston, standing by.

PAO This is Apollo Control at 95 hours 56 minutes. We are coming up now on LOS from the spacecraft as it passes behind the moon. And when next we acquire the vehicle will be on its 8th revolution. The crew now about 3 and a half hours from the end of their rest period and it continues rather quiet in mission control. Network advises us that we have LOS now, and during this back side pass while we are out of communication with the spacecraft, the maroon team of flight controllers will review proceedures that will be using in the lunar lift off, at about 142 hours 24 minutes GET time. At 95 hours 56 minutes, this is Apollo Control.

END OF TAPE

PAO This is Apollo Control at 96 hours 34 minutes and we're just about to acquire Apollo 14 at the eighth revolution of the moon. Now coming out on the topside. The crew is still in the midst of a rest period and we have about 2 hours 45 minutes remaining in that rest period. Stu Roosa the command module pilot has the watch on this sleep shift wearing a headset, and should it be necessary for any reason to awaken the crew, the call would go to Roosa. This is done at this time to provide the maximum opportunity of sleep to the lunar module pilot and the commander, Ed Mitchell and Al Shephard. Of course we'll be having an extremely long day with power descent tomorrow morning. At the present time we're showing Apollo 14 at an altitude of 40.7 nautical miles, moving down toward pericynthia, and the pericynthia reading at this time is 8.7 nautical miles, continuing to come down slowly as the FIDO expected it would. And the apocynthion, the high point of the orbit at 59.6 nautical miles. Although we don't expect any calls from the crew, we will standby with the lines up in the event that we should get a call. At 96 hours 45 minutes, this is Apollo Control Houston standing by.

END OF TAPE

PAO This is Apollo Control at 97 hours, 27 minutes. We're now a little over 2 hours away from the scheduled end of this rest period. The crew is scheduled to awake at about this time on the next revolution, the 9th revolution of the moon. During the sleep period, which has been relatively quiet in Mission Control, flight controllers have used the time to advantage to review flight plans, checklists and procedures for the coming days where a lot of busy activities are scheduled, in particular for this shift the procedures which will be used by each of the controllers and on each of the consoles for the powered ascent, the lift off from the moon. At the present time we show Apollo 14 at an altitude of 12.7 nautical miles. The spacecraft velocity at this time is 5535 feet per second, and as the spacecraft continues to climb toward apogee, which is now 59.5 nautical miles, that velocity will continue to drop off slowly, and then peak back up again to somewhat more than 55,000 feet per second as it drops on in toward pericynthion again. At 97 hours 29 minutes this is Apollo Control Houston continuing to stand by.

END OF TAPE

PAO This is Apollo Control at 97 hours, 49 minutes. And we're less than 45 seconds now from scheduled loss of signal with the spacecraft as it goes around the corner of the moon on this the eighth revolution. We'll be reacquiring again roughly 45 minutes after loss of signal. On the next revolution the sleep period is scheduled to end. We're now showing 1 hour, 40 minutes until the scheduled crew awakening time. And at the present time we show Apollo 14 with a pericynthion of 8.5 nautical miles. And our communications engineer reports we've had loss of contact now with the command module. At 97 hours, 50 minutes , this is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control Houston at 98 hours 38 minutes. We're about to regain radio contact with Apollo 14. The spacecraft now on its ninth revolution of the moon. And the crew is scheduled to end their rest period in about 51 minutes from now, about 2/3 of the way through this front side pass. At the present time we show Apollo 14 at an altitude of 41.5 nautical miles. The spacecraft velocity is 53076 feet per second. The pericynthion or low point of the orbit is 8.5 nautical miles, and the high point 59.7. And we have reacquired radio contact with the spacecraft. We'll stand by for the awakening of the crew or for any other communication between the ground and the spacecraft. We would not expect to put in a call to the crew before the wake up period, but we will be up and live should we receive any calls from the crew. This is Apollo Control standing by at 98 hours 39 minutes.

END OF TAPE

PAO This is Apollo Control at 99 hours, 14 minutes. We're now about 16 minutes from the scheduled end of the crew rest period and we do plan to awake them on this revolution if we do not hear from them we'll put in a call to the spacecraft. At the present time we're showing the spacecraft perigee ah - pericynthion at 8.4 nautical miles. Pericynthion continuing to drop. Flight Dynamics Officer perdicts that at power descent it will be down at about 4600 feet which is somewhat lower than nominal but would present no problems in fact as the Flight Dynamic's Officer expressed it, it would actually help with the descent increasing the propellant savings to the lunar module. We've had quite a bit of noise on the communications circuit. The high gain antenna has not locked up at this time in narrow beam width and we'll be checking with - one of the things we'll be checking with the crew on the awake is the settings of the high gain antenna to be sure that we're in the proper attitude with the antenna for reacquiring in narrow beamwidth.

SC Good morning, Houston. 14 here.

CAPCOM Apollo 14. Apollo 14. This is Houston. Roger. Good evening, Stu.

SC Good evening - it's good morning, Bruce baby.

CAPCOM Roger. How'd you all sleep?

SC And Bruce, I've got a crew status report for you.

CAPCOM Okay. Go ahead with your crew status report.

SC Okay. Al six hours of sleep, dosimeter 16048. Ed, six hours 05038.

CAPCOM Okay. Understand six hours of sleep each. 16048 01046 and 05038. Over.

SC That's affirmative.

CAPCOM 14, this is Houston. At this time we would like the CMP and the LMP to swap dosimeters. The LMP dosimeter is inoperative and we would like to have two active dosimeters on the lunar surface. Over.

SC Okay. We'll do that.

CAPCOM And 14, this is Houston. Now would you confirm a negative presleep status report. Over.

SC Well that's affirmative, we went to bed all healthy, no medication and we're getting up the same way.

CAPCOM Roger. Out.

CAPCOM Okay. When you're interested I have about 4 or 5 general information type articles to pass up to you all.

SC Okay Bruce. Some -

SC (Garble) be on hed set for us?

SC If it is, we could wait a few minutes.

CAPCOM Yeah, why don't we do that. There's no great rush in any of them but we've got 24 minutes to LOS and just let me know when you're ready.

SC Okay. I'll take consumables up anytime you've got it - we'll get that out of the way.

END OF TAPE

SC Okay, I'll take a consumables update anytime you've got it, and get that out of the way if you want to give it to me.

CAPCOM Okay, I'll have the consumables update for you momentarily. In the meantime we'd like you to read out the high gain antenna meters and the high gain antenna knobs. It has not been switching to narrow beam at AOS. We're not sure why right now. We'd like to leave the configuration as is and get those readouts, over.

SC Okay, Bruce, the -

SC Bruce, this is Ed. I've got my biomed hooked up, and my sensor connected and I'd like you to take a look at it while you're talking to Stu please.

CAPCOM I understand you have your biomed hooked up and your sensor is connected and you'd like the medics to look at it.

SC That's affirm.

CAPCOM We're in low bit rate right now Ed. We'll have to hold on a minute.

SC Okay, Bruce, the readouts on the pitch meter is 50 degrees, on the yaw meter is 270, on the knob is set at 35, and the, pitch, yaw knob is set at 275.

CAPCOM Okay Stu, on pitch, is that plus or minus, over.

SC Oh, sorry about that. Both are minuses.

CAPCOM Okay, meter pitch, minus 50, yaw 270, knob minus 35 and 275, over.

SC That's affirmative.

CAPCOM Okay, coming at you with a consumables update, over.

SC And let her rip.

CAPCOM At a GET of 99 hours even, RCS total 74 percent, quads in order, 73, 75, 73, 75, hydrogen 65, 65, oxygen, 85, 83, 31, over.

SC Rog, copy the GET 99 hours, RCS total, 74, quads, 73, 75, 73, 75, hydrogen 65, 65, 02, 85, 83, 31.

CAPCOM Roger, out.

SC Houston, 14.

CAPCOM Go ahead, Ed.

SC Are you going to switch over to high bit rate so you can look at this? I'd like to go ahead and start suiting up.

CAPCOM Stand by. Apollo 14, this is Houston. We request high gain antenna servo electronics to secondary, over.

SC Okay (garbled).

SC Okay, go to secondary.

CAPCOM Apollo 14, this is Houston. Request S-band normal transponder secondary, over.

SC Roger, transponder secondary.

CAPCOM Apollo 14, this is Houston, how do you read?

SC Loud and clear, how me?

CAPCOM Roger, reading you the same.

SC Houston, this is 14.

CAPCOM Go ahead, 14.

SC I'd appreciate an answer on your intentions relative to sensor.

CAPCOM Okay, Ed. Relative to the sensor, we require a high bit rate down here in order for the surgeon to get any biomed telemetry. We're attempting to get high bit rate at the present time as evidenced by our request for secondary electronics and a high gain antenna and a secondary transponder. We'll let you know just as soon as we can press on. Perhaps in the meantime you could tell us which sensor you think was giving you the problem and what you've done in the meantime to it, over.

SC Okay, the lower sternum sensor was leaking and we replaced it last evening and it seemed to be the only one that had a chance to be in bad shape.

CAPCOM We copy up.

SC It seems to be the only one that looked like it might be the (garbled).

CAPCOM Roger out and -

CAPCOM Apollo 14, this is Houston. Request high gain electronic, high gain antenna servo electronics power primary, s-band normal transponder to primary and go to track mode manual, over.

END OF TAPE

SC Houston, 14. Do you read, now?

CAPCOM 14. This is Houston. Roger. We're reading you about 5 by 4. Over.

SC Okay. I've got to give you primary servo electronics, primary transponder and what else did you want?

CAPCOM Roger. We want to go back to tract mode manual and we'll use the positions that you have set on the pitch and yaw dial at the present time.

SC Okay.

SC - -

CAPCOM Okay. And reading you about 4 by 2 at the present time. Stand by.

SC Houston. 14. Do you read?

CAPCOM Roger, Ed. We're reading you. We'd like you to do a normal manual acquisition, switching back the wide b and then coming all. Over.

SC Okay.

SC Houston, I have you on auto and narrow again and I cannot seem to get the signals straight about the 3 quarter mark.

CAPCOM Roger. I'm reading you. We'll get that noise in the background out.

CAPCOM Apollo 14, this is Houston. We request you attempt acquisition again using the normal manual procedures. Over.

SC Roger. Roger.

CAPCOM Apollo 14. Apollo 14, this is Houston. We suggest high gain antenna angle of pitch minus 25, yaw 280. I'll say it again pitch minus 25, yaw 280. Over.

CAPCOM Apollo 14, this is Houston. We suggest high gain antenna pitch minus 25, that is minus 25, yaw 280, yaw 280. Over.

CAPCOM Apollo 14, this is Houston. How do you -

SC Houston, Apollo 14. How do you read?

CAPCOM Roger. Loud and clear now, Ed. We've got 4 minutes to LOS.

END OF TAPE

CC Apollo 14, Stu, we've got 4 minutes till LOS. I have a 4 step procedure for testing the lunar topo camera. Are you ready to listen and copy?

SC Stand by one, Bruce.

CC Roger. We're standing by.

SC Okay, go ahead Bruce.

CC Okay. With respect to the high COMM, we think this may be a low current problem. We've been able to duplicate most of your symptoms down here in Building 4 with the other model. What we'd like you to do is step 1, disconnect all power connectors, inspect, and reconnect. Over.

SC Okay, we read. Disconnect all power connectors, inspect, and reconnect. And I guess - you know, we did it when we put it in and out, but if I understand your step right, they're all disconnected, I guess you mean, just look at the pins and so forth. Amplify that just a little bit Bruce.

CC That's correct. We'd just like you to inspect for bent pins, any sort of damage, cracked insulators, anything like that in error. Break, break for Ed. We are unable to verify your biomed harness at this time. We'd like you to change out biomed harness. Do not suit up and we'll check it over at AOS next pass. Over.

SC Roger. Understand. Change out to biomed harness and do not suit up.

CC Roger. You can suit up partially -

SC Be advised that - okay understand. Be advised that the high gain, I've tried manual procedures and about 3/4 of that signal strength I get.

CC Roger. We copy on the high gain. You can suit up partially if you want to take the risk of having to unsuit a little ways. Break, Break for Stu, step 2. We'd like you to switch nonessential power to opposite main BC box, that is from B to A or A to B whatever you were on last time. Step 3, reset control box film counter to 0, shutter speed to 1/200 of a second with magazine removed, visually examine the shutter curtain slip position. If the slit is visible, it should not be more than 1 inch from the magazine guiderail. Examine sprocket area for visible tears. Step 4, install magazine wrist key and actuate single flame. Remove magazine and verify that slit is not more than 1 inch from magazine guiderail, if visible, 30 seconds to LOS. I repeat, switch from nonessential power from bus B to A or A to B, opposite what you had, reset control box film counter to zero and shutter to 1/200 with magazine removed visually examine shutter curtain slit position, if visible, slit should not be more than 1 inch from magazine guiderail. Examine sprocket area for visible tears, install magazine wrist key and actuate single frame. Remove magazine and verify slit is not more

CC than 1 inch from magazine guide rail and we'll talk to you on AOS next time on the results.

PAO and network reports we've had LOS. Apparently that last message from the CAPCOM did get through. During the exchanges with the crew aboard the spacecraft, a couple of things of significance, the conversations with Ed Mitchell pertaining to his biomedical data relate to the fact that we're getting eratic biomedical data on Mitchell at the present time. We've asked him to change to one of the backup biomedical harnesses and the surgeon estimates that this changeover time is about a 10 minute operation. It should pose no problem as far as getting suited up. The suitup time is normally about 100 hours 30 minutes ground elapsed time. The network controller also advises that the manned spaceflight network station at Goldstone, California is having a computer problem at the present time and that station has been released. Goldstone is backup at this time with Madrid being the prime station. We'll be reacquiring Apollo 14 in about 47 minutes. The spacecraft will be at the beginning of its tenth revolution at that time. At the present time we show Apollo 14 traveling at a velocity of 53072 feet per second. The current spacecraft altitude is about 42 nautical miles and the orbital parameters are as follows, a pericynthion of 8.4 and the apocynthion of 59.7. At 99 hours 46 minutes, this is Apollo Control Houston

END OF TAPE

PAO This is Apollo Control at 100 hours 30 minutes. We're now a little less than 2 minutes away from reacquiring Apollo 14 on its tenth revolution of the moon and during this frontside pass a number of things will be discussed with the crew, among them as we reacquire now we're going to try a normal acquisition, a normal automatic acquisition on the high gain antenna. If we don't get locked in on narrowbeam width, then we'll try it manually and if we still don't get a good narrow beam lock on, the plan is to continue on with no further troubleshooting at the moment. Narrow beamwidth on the CSM high gain antenna is desirable but it is not essential to continuing with the mission. As far as the biomedical data on lunar module pilot Ed Mitchell that is also in the category of a very desirable items but is also not essential or mandatory for continuing and if, when we reacquire and presuming that Mitchell will have put on the backup biomed harness, if we still do not have a good biomedical data he will be advised to continuing along with the suiting up. Also (inaudible) reviewing the status of the ascent batteries with the crew. And we'll also be discussing the probe and drogue and some alternate undocking procedures if, in the unlikely, that the undocking does not occur as planned, we'll have some alternate procedures for the crew. Would emphamsize that we do expect the docking mechanism to work properly. We expect that we will get a normal undocking but in the event that we don't get a normal undocking we'll have a set of contingency procedures - backup procedures for the crew to use. We're standing by now for reacquisition.

CAPCOM Apollo 14. Apollo 14, this is Houston. How do you read? Over.

SC Read you quite clear, Bruce.

CAPCOM Roger, Stu. We're reading you with a good bit of background noise. We've got a few things to pass up to you if you're ready to listen.

SC Okay. Stand by just 1.

CAPCOM Okay. In the meantime Stu, for you or Ed, we'd like you to try a normal acquisition again on the high gain antenna and if that's NO GO try acquisition in MANUAL and medium bandwidth. Over.

SC Okay. Let me get down here and give it a go.

PAO Our prime network sight is Madrid, the Goldstone sight report said it had cured its computer problems and is back on line.

SC Apollo 14.

CAPCOM Okay. Loud and clear 14.

SC Okay Bruce, doesn't seem to be doing too good. Still can't get the lock up solid all the way. I'm in AUTO and medium now and that's where you want it?

CAPCOM That's affirmative, 14 and we're checking out Ed's biomed.

SC Okay.

CAPCOM Okay. In the meantime, an item of general interest on your orbital status. You started out somewhat high and are decaying at a slightly greater rate than predicted. However, the altitude at PDI will still be about 4600 feet. That's 4 6000 feet or 8.3 nautical miles so your pericynthion's still good. Over.

SC Okay. Sounds like good planning.

CAPCOM And Apollo 14, Stu, map update rev 11 if you're ready.

SC Negative. Stand by 1.

CAPCOM Apollo 14, Ed. This is Houston. You're GO to commence suitting up.

SC Roger, Roger. Thank you Bruce.

CAPCOM Biomed looking good.

CAPCOM Apollo 14, Ed, this is Houston. Can you monitor just for a minute the discussion on the ascent batteries.

SC (garble) . Go ahead.

CAPCOM 14, this is Houston. Our feeling right now is that this is a single cell problem in ascent battery number 5. If one cell were shorted out entirely and completely dischared, this would drop your terminal voltage by 1.8 volts. The expected voltage open circuit at activation is greater than 35.3. I say again, it's greater than 35.3. However, the open circuit voltage will not be our criterion. We will use the DELTA in voltage between batts 5 and 6 under load to evaluate battery 5. If there is more than a 1.8 volt DELTA between 5 and 6, that is, if it should turn out that you have a problem with more than one cell, then battery 5 will be NO GO. Over.

SC Understand Houston that if in subsequent checks we have more than one cell that shows up bad, battery 5 will be NO GO.

CAPCOM Roger.

SC Okay. And I'm ready for the rev 11 update, Bruce.

CAPCOM 14 Houston. Rev 11 180 degrees 102 03 40. Understand you don't need LOS or AOS they're close to nominal.

CAPCOM Apollo 14, this is Houston. I've got a lot of noise in the background now. Al, did you copy the time for 180 102 03 40. Over.

CAPCOM Apollo 14, this is Houston. How do you read now? Over.

END OF TAPE

CAPCOM Apollo 14, this is Houston. How do you read?

SC Loud and clear, Bruce.

CAPCOM Okay. We're reading you again now, Stu. We'd like you to go with manual and medium beam width, please.

SC Okay.

SC Okay, Bruce. The antenna seemed to oscillate a little bit. They're - steadied out now with a reasonably good signal.

CAPCOM Say that looks beautiful. That looks beautiful, Stu.

CAPCOM Stu, did you copy the time for 180 degree meridian, and 1020340?

SC That's affirmative, 1020340.

CAPCOM Roger. Were you able to run through the LTC camera checkout procedures one through four or we fade out on you before you got them?

SC That's negative on being able to run through them. I didn't even begin to get them copied, Bruce. I guess - I need - what time frame are you thinking of me trouble shooting that one? Is that something that we need to work out right now?

CAPCOM No. We'll hold off on that.

CAPCOM Okay, 14. On the subject of the docking probe situation, for undocking we anticipate a normal undocking sequence, that is extention followed by release of the LM. If there should be no release at this time, we request that you hold the release position of the extend or release and both vehicles thrust minus X for 3 seconds, and then release on the - or return the switch to center. Over.

SC Okay. Understand we're anticipating a normal SEP. If we get on the end of the probe and no release we'll both thrust minus X for 3 seconds.

CAPCOM Roger. While you hold the switch in the release position and we've got some other procedures that we'll run through in real time if the requirement developes in order to accomplish an undocking. We would like to say at this time though that we are not considering of blowing the docking range in order to undock. Over.

SC Okay. That sounds reasonable.

CAPCOM And is Al listening?

SC Al is not on the headset right now, Bruce.

CAPCOM Okay. I wonder if you'd pass to him that when he and Ed go over to the LM, they should either carry with them a tool R, that's tool Romeo from the command module or if he should have such a thing as a screwdriver or something like that available, why that would also suffice. Over.

SC Okay. I'll let him borrow a tool R on a hand receipt and he'll take that over with him.

CAPCOM Roger. Be sure and get a QC stamp on it.

SC 21 Nancy.

CAPCOM Roger, 21 nancy. Hey, a little more background on that thing that we're looking for of course would be an item such as tool R that enable our crewmen from the LM to depress the capture latch release button on the tip of the probe from the LM side and tool R will fill this bill or another screw driver if it were available. Over.

SC Okay. We got you.

CAPCOM And with respect to docking, again we anticipate normal operation, however, we'd like to add to the normal procedures a LM plus X thrust, 10 seconds for jet RCS to facilitate or give us just a little more of a warm feeling on the docking. Once again we have some backup procedures that we can run through in real time if these should be necessary and in order to formalize this I've got a flight plan update for the CMP solo book and for the LM time line book whenever you all are ready to copy these down.

SC Okay. Stand by here and let's get out the LM time line.

CAPCOM Roger. I'll do likewise down here. And we'll make them together.

SC Okay.

CAPCOM And since you don't have alot going on up there right now, Stu, I wonder if you could give us POO and ACCEPT and we'll send you up some uplinks. We've got a state-vector, a desired oriented RFSMATT, a - and that's it.

SC Okay. You have POO and ACCEPT.

CAPCOM Okay, Stu. You seem to be fading out a little bit. Are you close enough to the mike.

SC I - I'm talking right into it, Bruce. You have POO and ACCEPT.

CAPCOM Roger. Thank you. And would you return to the narrow deadband 5 tenths of a degree in the DAP, please?

SC Okay. Stand by one.

CAPCOM Rog. In reference to keeping the high gain pointed right at us here.

SC Okay.

SC Okay. I'm narrow deadband. I'm through with the DSKY, if you want to press with the uplink and looks like we got good signal strength here.

CAPCOM Okay. Looks real good here,Stu and we'll press on with the uplink and I got my time line book out and we're going to page 14.

SC Okay. We'll have to stand by on that LM time line book for a little bit here, Bruce.

CAPCOM Okay.

CAPCOM And back on the subject of the drogue, I guess our analysis down here and all the data that we've been able to come up with indicated that you did in fact have a normal retraction on the last attempt. The selection of the bottle did not contribute to the capture in itself and we'll pass you the procedures here that we'd like you to run through.

SC Okay.

SC Houston, 14.

CAPCOM Go ahead, 14.

SC Okay, Bruce. I - just something that seems like back from memory in debriefing from 11, they tried this plus X on the LM and docking and they got some - if I remember right - some attitude excursions. Is everybody satisfied that the LM can plus X and everything will be stable?

CAPCOM 14, this is Houston. Roger. We recall 11 and the biggest part of the problem there was that both vehicles were actively trying to control attitude. The procedure which we'll be passing up to you has you going into CMC mode 3 prior to the LM commencing it's plus X thrusting. Over.

SC Okay. So I guess we'll - we'll wait until we get the changes and then we'll talk about it if we've got any questions.

CAPCOM Roger.

END OF TAPE

CAPCOM 14, Houston. I have your CMC refsmat zero time update for you. There is no GET, or CSM update required, over.

SC Okay, and I'm ready to copy, Bruce.

CAPCOM Okay, CMC refsmat zero zero time is, 108 hours 53 minutes 5800 seconds and I'll have the TEI 19 pad shortly. You want to go ahead and read back?

SC Okay refsmat zero zero time, 108,108, 53, 5800.

CAPCOM Roger, read back correct I'll be coming at you with the TE 19 pad in about 10 seconds.

SC Okay.

CAPCOM And if you're ready to copy on Tei 19 I'm ready.

SC Okay, TEI 19, let her go Bruce.

CAPCOM Roger, Stu. SPS G&N, 36583 minus 066, plus 024, TIG 119 38 0913 noun 81, plus 29034, plus 15647, minus 04852, roll 179 120 029. The rest of the pad is na. Ullage, 4 jets 11 seconds. Remarks, this is an undocked burn, we assume circularization but no plane change number 1. The lunar longitude that you are crossing at time of tig is, minus 175.8 west longitude, over.

SC Okay, TEI 19, SPS G&N, 36583 minus 066, plus 024, 119 38 0913 plus 29 034 plus 15647 minus 04852 179 120 029 ullage 4 jets 11 seconds undocked assume circ, no plane change 1, and longitude of tig minus 175.8.

CAPCOM 14, this is Houston, read back is correct, out.

SC And Houston, 14.

CAPCOM Go ahead, Stu.

SC Okay, the LM command module Delta P is 0.8.

CAPCOM Houston, roger, out.

SC Stu, Houston. How is your viewing attitude up there?

CAPCOM It's rather tremendous Bruce. This, coming across this low, low orbit is phenominal, and this attitude is absolutely great.

CAPCOM I guess that settles that one.

SC I tell you one thing Bruce, you sure get the impression you're more like about a thousand feet, than 45,000.

CAPCOM I guess the scenery is really clipping along.

SC Yea, and it seems so close. It looks like you can just reach out and touch it.

CAPCOM The recent input from FAO is that we need the hicon camera checks prior to a GET of 107 hours. That's about 6 hours from now.

SC Okay, prior 107, and we'll sure try to give it a go.

CAPCOM Roger, and when ever you're ready on the flight plan update to the CMP solo book and the LM timeline book why we've got it setting down here, but there's no rush.

SC Okay, I can take the CMP solo book now but we might as well get them both together and it'll be a little bit here, they're getting the suits on.

CAPCOM Okay, well the details of the 2 are a little different.

SC Okay, let's get these out of the way, and take the solo book now.

CAPCOM Okay, on page 52.

SC Okay, go ahead.

CAPCOM At 144 hours and 08 minutes it presently reads, translate the capture latch, we want to change that to read, translate to contact, over.

SC Okay, we'll change that translate to contact, and hope they're both the same, huh.

CAPCOM Roger, roger. Under that, add in report contact to LM and CMC mode free, over.

SC Okay, and after contact, I'll report contact to LM and go CMC 3.

CAPCOM Roger, and over in the docking checklist we want to delete the CMC mode free, it says docking checklist at capture CMC mode free, you can delete that.

SC Okay, I'll delete CMC mode free under the docking checklist at capture.

CAPCOM And that's it. That wasn't so bad, was it.

SC No, that was pretty painless.

CAPCOM 21, Nancy.

SC Rog.

CAPCOM 14, Houston.

SC Go ahead Bruce.

CAPCOM Stu, we just got word that your family is listening to you and they're outside looking up at that great big Fra Mauro moon.

SC Thank you. Okay, Bruce, for their benefit, just to pinpoint, we approaching the terminator now and the Fra Mauro formation, and I guess of all the news you see I think it's going to be tough to beat this going into the terminator at this low altitude. It's, it's really something.

CAPCOM It sounds really spectacular. I'm sure we'd all like to be up there with you. I know I would.

SC Yea, I wish you could be. Yea, I wish you could be after all that hard work.

CAPCOM Apollo 14, this is Houston. We'd like to try the secondary servo electronics on the high gain antenna

CAPCOM and attempt a normal acquisition. If that is unsuccessful we'll return to the present configuration.

SC Alright Bruce, go on secondary now. Okay, how do you read Bruce?

CAPCOM Loud and clear Stu. Looks beautiful.

SC Yea, I went to secondary and there was not a glich in anything.

CAPCOM Are you in Auto now?

SC No, I'm sorry. I didn't get to the auto bit. I just went secondary on the electronics.

CAPCOM It's alright, now that you -

SC You want auto mode? Is that affirmative?

CAPCOM Now that you've got the secondary servo electronics up we'd like you to run through a normal acquisition procedure, over.

SC Oh, okay.

SC 14, Houston.

CAPCOM Okay, loud and clear, Stu. It looks like it was successful.

SC That's negative, I'm back in manual medium. What happends when I go to auto, the edge goes to about a -

END OF TAPE

SC What happens when I go to AUTO, the PITCH goes to about a minus 50 and the YAW stays just about the same, but it seems like the AUTO mode wants to drive the PITCH down to about minus 50 and if I do that in wide beam width, and then I go medium, narrow, it doesn't seem to have any effect, and the signal strength drops back off.

CAPCOM Okay, we copy, Stu.

SC And I'm back manual medium now.

CAPCOM Roger. Out.

CAPCOM Okay, Stu. We have your torquing angles. You're GO.

SC Okay, Bruce. Torque is 1012420.

CAPCOM 1012420.

CAPCOM 14, Stu, this is Houston.

SC Go ahead.

CAPCOM 14, Stu, this is Houston.

SC Go ahead.

CAPCOM Roger, Stu. Prior to commencing your manuever here, which it looks like you're about ready to do. we'll give you an OMNI antenna to select. Once you get to the new attitude, we'd like you to return to manual medium beam width and then we'll give you the PITCH and YAW angles. Over.

SC Alright, we're getting ready to manuever. You got the angles?

CAPCOM Okay, Stu. It's OMNI BRAVO while manuevering and the flight plan angles of PITCH minus 80 and YAW 98 are good.

SC Okay, OMNI BRAVO during the manuever and flight plan angles good when we get there. Thank you.

CAPCOM And with respect to the LM timeline book, we'll try to pass this up in real time during the tail end of the rendezvous. You might pass to Al, that it essentially makes the timeline book agree with what we gave you in the CMP solo book. Ten seconds or contact on the thrust plus at contact and then confirm docking. Confirm capture report from CSM.

SC Okay, Houston. We got that. And pass it up later is fine with us.

CAPCOM Roger. Just wanted to make sure you were aware of what we had in mind.

CAPCOM 14, Houston. 6 minutes to LOS.

SC Okay.

CAPCOM Apollo 14, this is Houston. 1 minute to LOS

SC Roger, Houston. Okay, 14 is on the timeline, Houston.

CAPCOM Say again?

CAPCOM Okay, 14. Down here we're going to turn it over to the good old gold team and the friendly maroon team will see you in a few hours.

SC Okay, stick around. We've got icecream. You'll be back for the fun, Bruce?

CAPCOM I will, yes indeed.

PAO This is Apollo Control at 101 hours 38 minutes and we've had loss of signal now with Apollo 14. During that front side pass, a number of things were discussed with the crew. I'd like to run back over several of the more significant ones, briefly. The biomedical harness switch, which was performed by Ed Mitchell, apparently took care of the problem. We have good biomedical data on him. We still have our problem with the high gain antenna and that problem essentially is in acquiring automatically, a narrow beam width. We have good lock on and good data in wide beam width. What we lose when we do not have the narrow beam width is high bit rate data, however, we can also, even get high bit rate data when we're on the 210 foot dish at Goldstone, California. The high gain narrow beam width is one of those desirable items, but is not essential for continuing on with the mission at this point. We also discussed with the crew, procedures for determining if battery 5 is GO or NO GO, and essentially, the criteria for determining whether that battery will be healthy enough to continue with the powered descent is to look at the voltage when the battery is once again brought on line and see if, under load, the battery 5 voltage stays within 1.8 volts of the voltage that we see on battery 6. I would like to point out that we have not seen battery 5 since the test that was run on it last night. We have not had telemetry data on the LM electrical power system since that time, however, in the tests that were run last night, under heavy load, battery 5s voltage was identical with the voltage we saw on battery 6. The Engineering Support Room here in the Control Center says that it will accept a voltage difference of up to 1.9 volts. We advised the crew 1.8 volts, but the engineering backroom says that 1.9 will be the actual criteria, which will be used. At this time we are optimistic that battery 5 will be in roughly the same shape that it was in when we saw it last night. And at that time, as I said, it was able to maintain full load, sharing as expected and with no voltage difference between battery

CAPCOM 5 and battery 6. We now have 42 minutes 45 seconds before we reacquire the spacecraft and at that time it will be at the beginning of its eleventh revolution. At this time in Mission Control, we are in the midst of a shift handover. Flight Director Jerry Griffin and the gold team of Flight Directors coming on to replace the maroon team. Capsule Communicator on the coming shift is Astronaut Fred Haise. Our orbital data on the spacecraft at this time is as follows: the apocynthion or high point of the orbit is now showing 59.8 nautical miles and the pericynthion is currently reading 8.1 nautical miles. And at 101 hours 42 minutes this is Apollo Control Houston.

END OF TAPE

PAO This is Apollo Control 102 hours 21 minutes ground elapsed time. We're less than 2 minutes away from acquisition of signal as the Apollo 14 spacecraft still docked, come around the front side of the moon again on this 11th lunar revolution. And at this time, the lunar landing crew should have been in the spacecraft 10 or 15 minutes beginning the power up sequence and checkout of the lunar module, getting it prepared for the landing tomorrow morning which will be around 3:15 Houston time. Here in the Control Center is the gold team of flight controllers taking over from the off going shift headed up by Milton Windler. Rather quiet in the Control Center as the flight controllers discuss among themselves the upcoming checkout of the lunar module. We'll begin to get telemetry about the same time we get voice. Continuing to stand by as we anticipate Apollo 14 being acquired by the ground stations primarily through the Goldstone station in California. We show Goldstone acquiring at 102 25 44, slightly over a minute from now. Apparently there was some confusion in the acquisition of signal clock here in the control room. And looking at the tables for station acquisition, we can see that we're still about a minute away from acquisition. We've had CSM AOS. Let's stand by for the air to ground communications.

CAPCOM Kitty Hawk, Houston.

KITTY HAWK Go ahead Houston, Kitty Hawk.

CAPCOM Okay. We're ready with some updates to you - or an uplinks rather if you can give us POO and ACCEPT.

KITTY HAWK Okay. You've got POO and ACCEPT.

CAPCOM And when you've got time Stu, I've got some data and a SEP pad ready.

KITTY HAWK Okay. Stand by 1.

KITTY HAWK Okay, Antares. How do your read Kitty Hawk B?

ANTARES Okay Kitty Hawk. Antares' LMP reads you loud and clear.

ANTARES CDR reads you loud and clear Red.

ANTARES Let's go VHF A.

KITTY HAWK Negative. Stand by 1.

ANTARES Kitty Hawk, Antares. Start counting 1, 2, 3, 4, 5, 4, 3, 2, 1.

KITTY HAWK Oh, you're loud and clear now.

ANTARES Okay. Let's go VHF A.

ANTARES How about me? Am I loud and clear?

KITTY HAWK You're loud and clear fearless one.

ANTARES Good show, Rojo.

KITTY HAWK Okay. Go ENABLE.

KITTY HAWK Okay Antares, Kitty Hawk on A simplex. How do you read?

ANTARES Aw Roger, Kitty Hawk, Antares reads you loud and clear A simplex.

KITTY HAWK You're loud and clear ED?

ANTARES Same here.

KITTY HAWK You're loud and clear, Al.

ANTARES Houston, this is Antares, over.

CAPCOM Antares, Houston. Read you loud and clear.

ANTARES Okay. Stand by.

ANTARES Houston, primary EVAP flow number 1 OPEN 1021545.

CAPCOM Okay. Copy now.

ANTARES Okay and your lift power transfer time was 1015402.

CAPCOM Roger. Ed, we got it.

ANTARES And let's have a secondary S-band check.

CAPCOM Okay Ed, we're reading you loud and clear on secondary S-band and they're ready for primary.

ANTARES Okay. Let's go PRIMARY.

CAPCOM Kitty Hawk, Houston, the computer is yours and are you ready for the updates yet?

KITTY HAWK Okay Fred. The computers mine and go ahead.

CAPCOM Let me give you your DAP data first. Your CSM weight is plus 36116. Your gimbal turns, PITCH minus 081 YAW plus 019.

KITTY HAWK Okay. The DAP data, weight 36116, minus 081 plus 019.

CAPCOM Okay. That's a good read back and if you've got the plan books out, I'll give you a SEP pad.

KITTY HAWK Okay.

ANTARES Houston, Antares, if you read me, I'll press on.

CAPCOM Roger Ed. You're loud and clear. Press on.

ANTARES Okay.

CAPCOM And Kitty Hawk, I understand you're ready for a SEP pad.

KITTY HAWK That's affirmative, Fred. Let her go.

CAPCOM Okay. Your NOUN 33, is 104273100. PITCH is 103. That's it.

KITTY HAWK Okay. Copy 104273100 and PITCH 103.

CAPCOM Okay. That's a good read and now I have a P24 landmark track data for you.

KITTY HAWK Okay. I'm ready to copy.

CAPCOM Okay T1 1045655. T2, 4533, TCA 1045903 T3 1045925 355297 and 000. South 6 and use 14 dash 1.

KITTY HAWK Okay. Copy this is 14 dash 1 and T1 1045655, 104 5833, 1045903, 1045925 355297000, it's south 6 and 14 1.

CAPCOM Okay. That was good Stu and one more thing - a mapped up date for rev 12.

KITTY HAWK All right, I'm ready.

CAPCOM Okay. The 180 degree point at 1035728.

KITTY HAWK Okay. 1035728 that's update rev 12.

CAPCOM Good readback.

CAPCOM And one other thing Kitty Hawk, could you verify that the docking angle was still plus point 9.

KITTY HAWK That's affirmative, plus 0.9.

CAPCOM Okay.

ANTARES Houston, Antares. How do you read on the steerable antenna?

CAPCOM Okay Antares, I read you loud and clear.

ANTARES Okay.

ANTARES Stu, I'm ready for a gimbal angle check here.

KITTY HAWK Okay. Want me to go MAN deadband and so forth?

END OF TAPE

(garble)

CAPCOM And Kittyhawk, Houston.

ANTARES - - 02387

KITTY HAWK Read R3 again - -

ANTARES Okay. You got middle gimbal plus 02387.

KITTY HAWK That's affirmative. Go ahead, Houston, Kitty Hawk.

CAPCOM Okay. I guess we've got the LM back now. Antares, Houston. Just want to verify you're in AUTO on the steerable.

ANTARES That's affirm, Fredo. I went to AUTO and it was holding at a signal strength of 3.9 and I looked back over and we're - suddenly we have 3 and I tried to relock and I can't above 3 except on the OMNI.

CAPCOM Roger, Ed.

ANTARES If you'll give me a new set of angles, we'll try it again.

CAPCOM Stand by.

CAPCOM Okay, Antares, Houston. We'd like you to try the steerable again and the flight plan angles are 116 and 41. Should be good.

ANTARES Okay. Here we go again.

ANTARES Houston, Antares. I've locked back up on the steerable and that antenna's making a hell of a racket when it drives.

CAPCOM Roger, Ed.

CAPCOM And Antares, Houston. We have good lock now and we'd like to verify you're in AUTO and the noise again - we're not knowing what level you're hearing, there is quite a bit of noise with that antenna.

ANTARES Rog. You said that. It's just suprisingly much more that I expected suddenly and I am in AUTO. And it seems to be holding at a signal strength of about 39 right now.

CAPCOM Okay. And Antares, whenever you get time there to copy, I've got your X abort concentrate.

ANTARES Okay. I'd like to hold those for a minute Fredo.

CAPCOM Mighty fine, Ed.

ANTARES Okay, Stu, we're (garble)

KITTY HAWK Okay.

ANTARES Okay, Stu. We're ready for snapshot on NOUN 20 whenever you are.

KITTY HAWK Okay. Standing by for your mark.

ANTARES Okay. 3, 2, 1, MARK.

KITTY HAWK Okay, on your mark I read plus 00687, plus 11777, plus 02366.

ANTARES Okay. Give them to me again, please. I was copying time GET.

KITTY HAWK Okay. Plus 00687, plus 11777, plus

KITTY HAWK 02366.
ANTARES Okay, NOUN 20 as follows 00687, 11777, 02366.
KITTY HAWK That's a good readback.
ANTARES Houston, Antares. I'll take the (garble) now.
CAPCOM Roger, Antares, and we copied the NOUN 20 down here.
ANTARES Okay, and GET was 102:42:21.
CAPCOM Roger. GET 102:42:21 and here's the AGS abort console set, 224 plus 60464, 225 plus 29400, 226 plus 60480, 305 minus 01760, 662 minus 54516, 673 minus 31704.
ANTARES Okay, Fredo. 224 plus 60464, 225 is plus 29400, 226 is plus 60480, 305 minus 01760, 662 minus 54516, 673 minus 31704.
CAPCOM Okay, Antares. That was a good readback.
ANTARES And Fredo, I'm coming on with ascent battery check, if you would like to watch that.
CAPCOM Stand by.
CAPCOM Antares, Houston. You have the GO for the ascent battery.
ANTARES Okay. BATT 5 normal feed coming on now.
KITTY HAWK Okay, I've got CP time, are you ready?
ANTARES Yes. Do you want me to set it up on 102:47?
KITTY HAWK That'd be great.
KITTY HAWK 3 seconds, hack 102:47. Did you get that or would you like 102:47:30.
ANTARES No. I have that. Stand by for a snapshot on NOUN 65, please.
KITTY HAWK Okay. I'm standing by.
ANTARES Okay. VERB 06, NOUN 65, 3, 2, 1 MARK.
KITTY HAWK Okay, on your mark I read 102:47:2835.
ANTARES 102:47:2835. Thank you.
KITTY HAWK Rog.
ANTARES Okay. You got a little T EPHEM over there somewhere I might be able to use, either A or B depending on which one you like.
KITTY HAWK Okay. Stand by. Okay, T EPHEM. Are you ready to copy?
ANTARES Go ahead, Stu.
KITTY HAWK Okay. 4 Ball 6, 3522316020.
ANTARES You cut out there during the middle of it. Will you give it to me again, please?
KITTY HAWK Okay. 4 Ball 6, 3522316020.
ANTARES Okay, I have 406, 3522316020.

KITTY HAWK Okay. Let's verify R1, that's 0006.

ANTARES That's verified. 00006.

KITTY HAWK Okay.

ANTARES Houston, Antares.

CAPCOM Go ahead, Antares.

ANTARES Our battery check is complete the ED BAT voltage are 37.0, 37.0 and it appears that BATS 5 and 6 look exactly like they did last night.

CAPCOM That looks great, Ed. 37 on each of the ED's and we'll now get the work configured for his VERB 74.

ANTARES Okay.

ANTARES Okay and we got the T EPHEM where it is. And VERB 74 coming down.

ANTARES Houston, Antares.

CAPCOM Go ahead, Antares.

ANTARES Do you have the update for our DAP VERB 48 numbers?

CAPCOM Stand by on that one, Ed. I do have some LM torquing - gyro torque angles for you.

ANTARES Okay. Roger.

KITTY HAWK And Al, when you get a chance, I'd like to verify the capture latches.

CAPCOM Okay, Antares, Houston. I have the DAP data now if you want to copy that.

ANTARES Go ahead. Ready to copy.

CAPCOM Okay. LM weight plus 340039 - -

END OF TAPE

CAPCOM Okay, LM weight, plus 34 039, CSM weight plus 36 116 and your gimbal angles as loaded in the computer are good.

SC Roger.

CAPCOM And Antares are you ready for the gyro torque angles now.

SC Stand by.

CAPCOM That's over on about page 226, Ed.

SC Okay, ready to copy.

CAPCOM Okay, plus 00960 minus 00170 plus 00640.

SC I read back x plus 00960 y minus 00170, z plus 00640.

CAPCOM Okay, that's correct and I need a read back on the weights. I didn't get that from you.

SC Roger, the LM weight, 34039, command module weight, 36116.

CAPCOM Okay, that's good Antares.

SC And Houston, I'm in my S-band antenna stop. I'm going to have to go to OMNI's, I think.

CAPCOM Roger, Ed.

SC Houston, Antares.

CAPCOM Go ahead, Antares.

SC My S-band sterrable pitch needle is sitting at 255 and will not move. The yaw -

END OF TAPE

ANTARES My S-band steerable pitch needle is sitting at 255 and will not move. The YAW seems to be working okay, however, I do not think that I'm in the STOP.

CAPCOM Okay. We copy, Antares. Your PITCH reading is 255 and INCO concurs that it appears down here you're not in the STOP.

ANTARES Okay, if you like, I took it out for safety's sake, I'll put it back on AUTO TRACK if you give me the angles again.

CAPCOM Okay, stand by.

CAPCOM Antares, the numbers are plus 121 and 40, plus 40 on the YAW.

ANTARES Good. Roger. 121 and 40.

ANTARES Okay, Houston. You're locked up on the steerable and my PITCH needle is still sitting at 255. I think we have a failure in it.

CAPCOM Roger, Ed.

KITTYHAWK Okay, Houston. This is Kitty Hawk. We're getting ready to drop the landing gear.

CAPCOM Okay.

ANTARES Okay, Houston. The gear deployed and we've got a grey clock back.

CAPCOM Roger, Antares.

CAPCOM And Antares, Houston. Would you verify that the top display breaker is closed on 60.

ANTARES That's verified.

CAPCOM Roger, Ed.

ANTARES Remember, Fred, I've got 1 good needle and 1 bad needle.

CAPCOM Okay, that wasn't clear. We weren't sure if you just say one drove or not - Go ahead Antares.

ANTARES Okay, we're ready to press ahead with

KITTY HAWK Roger. Fred-o. Okay, Antares.

ANTARES Houston, we're ready to press ahead with RCS pressurization.

CAPCOM Go, Antares. Roger.

KITTY HAWK Go ahead.

ANTARES Okay, we're go for RCS press.

KITTY HAWK Hey, Al, when you get a chance, I need another verifier on the capture latch.

ANTARES Okay, Houston. Pressurization looked good, and helium press 2850.

CAPCOM Roger, Antares.

ANTARES And Houston. We're standing by for RCS checkout and Stu, we need wide deadband and HOLD.

KITTY HAWK (garble)

CAPCOM Hey, Antares, we're GO for the RCS checkout.

ANTARES Roger.
KITTY HAWK Okay, I'm seeing (garble)
ANTARES No, we need that HOLD, Stu, wide deadband and then HOLD.
KITTY HAWK Okay, this your RCS checkout
ANTARES That's affirm.
KITTY HAWK Okay, I'm (garble), I'll give you (garble) wide deadband.
ANTARES Great.
CAPCOM In the first part, Kittyhawk is a (garble)
ANTARES Okay, Stu, you can go free now.
KITTY HAWK Okay.
ANTARES Houston, here comes the hard part. The hot fire check.
CAPCOM Okay, Antares, we're ready.
CAPCOM Kitty Hawk, Houston. We'd like OMNI ALPHA.
CAPCOM Kitty Hawk -
ANTARES Is that for Kitty Hawk?
CAPCOM That's affirm. We'd like OMNI ALPHA.
KITTY HAWK Okay.
ANTARES Stu, hot fire checks are complete.
KITTY HAWK Okay.
CAPCOM Roger, Antares.
CAPCOM We're showing you a little YAW rate now.
ANTARES Go ahead. Say again, Houston.
CAPCOM We're showing a little rates on -
KITTY HAWK Why don't you bang - take the - why don't you take the rate out before I go back to AUTO, Ed.
ANTARES Okay, You'll have to tell us when way, Ed. We're not showing any rates.
KITTY HAWK Okay, touch it a little right yaw there.
KITTY HAWK Okay, hit it again, again, you got .2 of a second to go. Again, again, again, again, 2 more times.
KITTY HAWK Okay, that's good.
ANTARES Okay.
CAPCOM Antares, Houston.
ANTARES Go ahead, Houston.
CAPCOM When you can work it in here, we'd like you to go back to page 212 and repeat step 7, which is terminate cell test.
ANTARES Wilco.
ANTARES Okay, we'll do it again, Houston.
CAPCOM Okay, Antares, we don't need the whole cell test again, just step 7, the termination step will do.
ANTARES We understand.
CAPCOM Roger.

CAPCOM And Kitty Hawk, Houston. We're showing your cabin pressure up to about 57 now.

KITTY HAWK That's affirmative. I see it.

ANTARES Houston, I'm ready for an uplink. Are you ready to give it to me?

CAPCOM Okay, give us P00 and data and we'll start it up.

ANTARES You have it.

CAPCOM Roger, Ed. Antares, Stu, you look good from this side. You ready for hatch closure.

KITTY HAWK That's affirmative. I'll be ready in just a little bit.

ANTARES Okay, you want us to stand by.

KITTY HAWK No, you can go ahead and close your hatch.

ANTARES Okay, proceeding.

END OF TAPE

CAPCOM Antares Houston, the computer is yours.

ANTARES Okay, thank you.

CAPCOM Antares, Houston.

ANTARES Go ahead, Houston.

CAPCOM Okay, with your meter problem there on the S-band, Ed, you might change your LOS procedure to go on pitch 90, yaw 0, and slu.

ANTARES Okay, I'll do that Fred-o and I just now noticed the meter is back with me again but I suspect it's not very reliable.

CAPCOM Okay.

ANTARES Houston, we had a program alarm 1106 if you'd note it.

CAPCOM Okay, Ed, we saw it here, and you can press on.

KITTY HAWK Okay, Al would you verify your hatches closed and the dump valve auto.

ANTARES Verify.

KITTY HAWK Okay, I've got the, all 12 latches released and the hatch in and I'm proceeding to bend down stuff.

ANTARES Good show.

ANTARES Houston, Antares.

CAPCOM Antares, Houston, I've got a xk factor here for you.

ANTARES Go.

CAPCOM Gains plus 00100 plus all zips plus 00072.

ANTARES Understand 100 all zeros, 00072.

CAPCOM That's correct Ed. 7 tenths of a second.

ANTARES Do you have an LOS pad for me Fred-o?

CAPCOM Okay, I'm showing LOS in about 8 seconds.

ANTARES Thank you.

PAO This is Apollo Control. We've had loss of signal. Apollo 14 is nearing the end of its 11th lunar revolution. We're now in 103 hours 31 minutes ground elapsed time. As Apollo 14 came out from behind the moon earlier in this revolution the landing crew, Shepard and Mitchell were in the Lunar Module beginning to power up the systems. They encountered some problem in locking up with the sterrable antenna of the lunar module but this was sorted out later. Apparently there was a malfunction in one of the needles or indicators that showed antenna orientation. In the checkout of the ascent battery, storage batteries, battery 5 was reported by Mitchell to be in the same shape it was in the test late last night prior to the time it went into lunar orbit. The open circuit voltage of battery 5 was still hanging in at 36.7 volts and again the loads were cycled on this battery and its sister battery number 6 of up to fairly

PAO high averages, shared the load quite well when the load was split and the voltage was dropped down to around 29 and a half or 30 volts when the full load was applied on it alone with battery 6 turned off. Landing gear was deployed at 102:59 ground elapsed time and the hatch was closed just prior to LOS, the lunar module hatch that is, at about 103 hours 17 minutes. There was brief mention in the program alarm during the time that a load was being sent up by a command into the lunar module computer. It was program alarm 1106 which turns out to be uplink too fast. In other words the, all the numbers were being pumped in at too high a rate for the computer to digest. We have acquisition again on Apollo 14 in the 12th revolution in 45 minutes 28 seconds from now. Some of the significant items during that revolution will be of course undocking and separation at about 104:27, throttle check for the descent propulsion system, some photography of the undocking of course, which is sort of standard operating procedure, calibration of the landing point designator which is a grid system in the commanders window in the lunar module, calibration of the abort guidance system, command service module circularization maneuver at 105 hours 46 minutes. The LM will maneuver to observe this and photograph it with a 16 millimeter camera, however this will be on the back side, in other words after the next front side pass. At 103 hours 35 minutes ground elapsed time this is Apollo Control.

END OF TAPE

PAO This is Apollo Control 104 hours 18 minutes ground elapsed time about a minute out from acquisition of Apollo 14 coming around from behind the moon on the 12th lunar revolution. Flight Director Gerry Griffin has asked all the flight controllers in the room to go amber on his status board and his particular console and as they give him the go for undocking they will punch up green. 28 seconds to acquisition, we should be getting an indication before too many more seconds of incoming telemetry. That's usually the first thing the network advises the flight director that we have telemetry. We're standing by and should come any moment now. At AOS CSM.

KITTY HAWK Hello Houston. Do you read Kitty Hawk?

CAPCOM Kitty Hawk, read you loud and clear.

KITTY HAWK Okay.

KITTY HAWK Like we're standing by for a GO for SEP.

CAPCOM Roger. Kitty Hawk.

CAPCOM Antares, Houston. Are you unlocked?

KITTY HAWK Antares, do you have a lock up for Houston?

ANTARES Roger, stand by.

ANTARES Okay, Houston. You're locked up.

CAPCOM Roger, Antares. We would like high bit rate.

ANTARES Fred, you have it.

CAPCOM Antares, Houston. Could you try the servo again?

ANTARES Houston, let me put you on OMNI until we get undocked (garbled) right now.

CAPCOM Okay, Ed.

KITTY HAWK Okay, Houston, do you want the ... I got the gimbal angles ready for you if you're ready to copy.

CAPCOM Okay, go ahead.

KITTY HAWK Okay. The drift check GET of 103 58 25, command module is as follows 00769 113 04 02288. Are you with me?

CAPCOM Roger.

KITTY HAWK Okay. LM as follows 29339 29305 33709.

CAPCOM Okay. In CM 00769 113 04 02288, LM 29339 29305 33709, and GET of 103 58 25.

KITTY HAWK Okay.

CAPCOM Kitty Hawk and Antares you have a go for undock.

KITTY HAWK Okay. On pressure.

CAPCOM Okay. I'd just like to reiterate some words I think you passed from Bruce earlier. If nob on dock does not take place, after you get things damped out again we need 5 seconds of minus X thrusting by both vehicles. And, Kitty Hawk should call the thrusting on and off.

KITTY HAWK Okay. You want (garbled) 3 by 4 but,... Okay. We want each one a minus 5 seconds while I'm holding the switch.
CAPCOM That's affirm, Stu. And, you should call the on and off command.
KITTY HAWK Okay. I'm going to try the nominal first.
CAPCOM That's affirmative.
KITTY HAWK Okay. Antares, how do you read on vox.
ANTARES Loud and clear.
ANTARES Okay, loud and clear.
KITTY HAWK Okay.
ANTARES Okay.
ANTARES Get the (garbled) on, S-band.
ANTARES What's that?
ANTARES Houston, I have you locked up on steerable.
CAPCOM Roger, Ed.
ANTARES Okay, I'm going to keep you on this now
KITTY HAWK Okay.
ANTARES I'll keep the hold on it till you do.
ANTARES Give me about 5 seconds, Stu. Need another 5 seconds.
KITTY HAWK Okay.
KITTY HAWK I'm short 10, we'll make it 15.
ANTARES Take it.
ANTARES (garbled)
KITTY HAWK Okay. That's zero will you be ready to go at 5. Are you ready, Al.
ANTARES Okay.
ANTARES We're ready go.
KITTY HAWK Okay. Okay, you're moving out, and you're hanging on the end of the probe. We'll wait till motions damp here. Okay. We seem real steady. I'm going to back off from you.
ANTARES Stu.
KITTY HAWK And, we're free.
ANTARES Beautiful, very good.
KITTY HAWK Okay, we have a normal undocking.
ANTARES Okay. Deadband (garbled) group 77 go to POO.

END OF TAPE

ANTARES Okay. Yaw left 60, pitch up 90.
ANTARES Starting left yaw pitch.
KITTY HAWK Okay. Boy, you look mighty pretty out there.
ANTARES And starting pitch up.
ANTARES Yaw right 60, yaw left 60, pitch up 90.
CAPCOM And Antares, Houston. We've lost data on you now. We'd like your - what you ended up with NOUN 83.
ANTARES Rog. We ended up with - 1 plus .1, minus .1 - minus .1 plus .1 and 0.
CAPCOM Roger, Ed.
ANTARES Houston. You reading? Minus .1, minus .1 and 0.
CAPCOM Okay, minus .1, minus .1 and 0.
ANTARES Houston. I have you back on the OMNI but it doesn't seem to be tracking.
CAPCOM Roger, Antares.
ANTARES I'll give you low bit rate if you want it.
CAPCOM Okay, Antares. You can stay in high.
ANTARES Roger.
KITTY HAWK Okay, Al. You around to help me to verify your tracker light. And it's loud and clear.
ANTARES Okay, Stu. We have you and have the camera on and you look mighty pretty out there.
KITTY HAWK Yes. I've been taking a few shots of you there. Pretty impressive. Okay, DAC going off.
CAPCOM And, Kitty Hawk, Houston. B mag is ready too.
KITTY HAWK Roger.
ANTARES Houston, Antares. You're back on the steerable.
CAPCOM Roger, Antares and I got a (garbled) PCA for you.
ANTARES Roger. Stand by one.
ANTARES Houston, Antares. I'd like to re-check those gimbal angles with you again please.
CAPCOM Okay. Go ahead, Antares.
ANTARES A little bit rushed there. Let me just give you the command module and LM angles again. Command moudle 00769, 11304, 02288 and LM I had 29339, 29305, 33709.
CAPCOM Okay. And Antares I copied command module 00769, 11304, 02288. LM 29339, 29305, 33709, and the g.e.t. was 103:58:25.
ANTARES That's correct, Fred. Thank you.
ANTARES Fred, I'm ready for the landing on red twelve, PC8.

CAPCOM And Antares, Houston. The TCA was 104:59:38. And we'd like to get the steerable again, pitch plus 66, yaw minus 43.

ANTARES Roger, Fredo. You have the steerable again. Be advised, it seems to track for a few minutes and then breaks off and then heads for the stop.

CAPCOM Roger, Ed. The last loss there was due to a problem we had on the sight on the ground here.

ANTARES Okay.

CAPCOM And Antares, did you copy the TCA term?

ANTARES Roger. 104:59:38.

CAPCOM Very good.

CAPCOM Kitty Hawk, Houston. OMNI alpha.

KITTY HAWK Okay. You got OMNI alpha, Houston.

CAPCOM Roger, Stu.

END OF TAPE

ANTARES Houston, Antares, we'll proceed with the dip throttle check if you're ready.

CAPCOM Roger, Antares that'll be alright and if you give us po and data we'll pump you up a command module state vector.

ANTARES You have it and we're proceeding with the throttle check.

CAPCOM Roger.

ANTARES Okay, engine stop, push. We have a light. Okay, Houston, engine in the garb and here we go with the command (garble). Stop, stop. Alright. Back it in. Go to you with the LMV it's in (garble). Stop, stop. And going to back.

CAPCOM Antares, the throttle check looks good.

ANTARES Okay, arm off.

CAPCOM Antares, Houston, the computer is yours.

ANTARES Thank you.

CAPCOM And Antares, Houston, you can proceed on by the program (garble)

ANTARES Okay, thank you.

PAO This is Apollo Control. Presently under way onboard Antares is descent propulsion system throttle check. There was considerable jubilation here in the mission control room when the successful undocking was accomplished. In the room are the backup Apollo 14 crewmen, Gene Sirnan, Ron Evans and Joe Ingal, and Apollo 15 commander, Dave Scott. Others in the room include Apollo program director, Rocco Petrone Apollo spacecraft manager, Jim McDivitt, and mission director, Chet Lee. We'll continue to monitor air-ground as the crew of Antares continues with the checkout of the propulsion systems onboard the lunar module.

END OF TAPE

ANTARES Houston, Antares.
CAPCOM Go ahead, Antares.
ANTARES Rog. We're going over Hipparechus L and Hipparechus C at 8 minutes before the landing site. Looks just like the map.
CAPCOM Roger, Ed.
ANTARES Okay, we got Alpetragius on the left.
CAPCOM Roger, Al.
ANTARES We have Hipparchus J on the right as we're going over it. It looks like it's right below us, about a thousand feet.
ANTARES Instead of forty.
ANTARES There's a muller ahead of us, muller A on the left, muller O first.
ANTARES Hipparchus K out to the right.
CAPCOM Look's like you're right on the line.
ANTARES Yeh, we sure are.
ANTARES Fred, I don't see how we could clear that ridge ahead of us, it sticks up so far.
ANTARES Ptolemieus A on the left.
CAPCOM Roger, Al.
ANTARES We look like we're at thousand feet above it and Stu's below us.
ANTARES Here's Herschel out - Herschel out to the right.
ANTARES And the camera is started, Fred-O as we cross Lalande N and NA.
CAPCOM Roger, Ed.
ANTARES Might even get a picture of Stu ahead of us crossing Lalande Sea.
CAPCOM Okay.
ANTARES Okay, Fred-O, we're coming over the Turner Crater, looks just like on the map as we approach the site.
CAPCOM Roger, Ed.
CAPCOM Do you have about the same picture with respect to the shadows on those ridges up ahead, Ed, as the map?
ANTARES They don't seem quite as long as on the map, Fred-O.
CAPCOM Okay.
ANTARES Okay, Houston. We've spotted the general area of the landing site from the Rima Area on in. We didn't spot Cone Crater on this pass, however.
CAPCOM Okay, Al. We'll get a look at it a couple passes later.
ANTARES And, Fred-O, as we come up on Lansberg here, it's - the terminator is running right across it. And it is a big one. It really has a steep rim - or rather a high rim, very noticeably high rim from here, and it's

ANTARES - the terminator goes right through it.
CAPCOM And, Antares, you can use the same LOS procedures on the SERVO.
ANTARES Okay.
KITTY HAWK Okay, Houston, this is Kitty Hawk.
CAPCOM Loud and clear, Kitty Hawk.
KITTY HAWK Okay, that pass went just as advertised. I think we've had plenty of marks on it.
CAPCOM Very good, Stu.
KITTY HAWK Antares, Kitty Hawk.
ANTARES Go ahead.
KITTY HAWK Okay, I'm going to be setting up for a ranging deflecting.
ANTARES Okay, we're straight toward the timeline.
KITTY HAWK Okay.
CAPCOM Kitty Hawk, Houston.
KITTY HAWK Say again, Ed.
KITTY HAWK Go ahead, Houston.
CAPCOM Roger, Kitty Hawk. We'd like to crank up the high gain, PITCH minus 87, YAW plus 281, MANUAL on wide so we can get a tape dump.
KITTY HAWK Okay, minus 87 and say again the YAW.
CAPCOM YAW plus 281.
KITTY HAWK 281. Okay I reading point 53, make that point 55, mine keeps varying a little bit.
ANTARES Okay, Stu (inaudible)
KITTY HAWK Okay, I'm reading point 57.
ANTARES Point 57, thank you.

END OF TAPE

ANTARES Houston, Antares.
CAPCOM Roger, Antares.
ANTARES My S-band antenna circuit breaker has popped twice now. I think that may be the reason we're breaking lock occasionally. We got some problems in it.
CAPCOM Okay, Ed. Is that the AC or on your side the DC one?
ANTARES That's the DC one on panel 16.
CAPCOM Okay.
ANTARES It seems like it might be overheating on us possibly.
ANTARES Okay, Houston. I'm locked up again. The circuit breaker is holding for the moment.
CAPCOM Roger, Ed.
KITTY HAWK Houston, Kitty Hawk. Did you get the torquing angles?
CACPOM And negative, Kitty Hawk.
KITTY HAWK Okay. Ready to copy?
CAPCOM Go ahead, Stu.
KITTY HAWK Okay. 00030, minus 00038, plus 00028, torque at 105:08:40.
CAPCOM Okay, Antares, Houston. We'd like you to back out of that 52. We need to look at a bit here.
ANTARES Roger. Do you have the pads ready for me this time, Fred?
CAPCOM Okay. They're coming up in a minute, Ed. You ready to copy a couple of steps here?
ANTARES Yes. Go ahead.
CAPCOM Okay. We'd like the VERB 11, NOUN 10 enter, 30 enter.
ANTARES You got it.
ANTARES You read the DSKY, Houston.
CAPCOM Antares, Houston. What we're looking at there is the abort bit and it looks set and we'd like to proceed with the following to reset it.
ANTARES Okay. Give me the word.
CAPCOM Okay. We need the stop push button, pushed. And the next thing is the abort push button depressed. And wait on that one.
ANTARES Okay. Standing by on that one.
CAPCOM Okay, I meant you can go ahead and press the abort button, Ed, but stand by for our word on the reset.
ANTARES Okay. It's set.
CAPCOM Okay. Stand by.
CAPCOM Antares, Houston. You can reset the abort push button.
ANTARES Okay. It's reset.
CAPCOM Okay. You can reset the stop button.

CAPCOM You can reset the stop button now, Ed and press on with the P52.

ANTARES Okay.

ANTARES Okay. Stop button is reset.

CAPCOM Okay. And back to Kitty Hawk now. I missed the sign on your firsttorque angle there, Stu.

KITTY HAWK Okay. It was plus 00030.

CAPCOM Okay. I copy plus 00030, minus 00038, plus 00028, at 105:08:40 and we need wide beam.

CAPCOM Correction on that. We need medium, Stu. Medium for the dump.

KITTY HAWK Okay. Read me the first torquing angle again, Fred.

CAPCOM Okay. I copied plus 00030.

KITTY HAWK Okay. That's correct. And I'm in manual and medium.

CAPCOM Very good.

CAPCOM Kitty Hawk, Houston. We'd like POO and ACCEPT and I got some pads ready for your circ.

KITTY HAWK Is that Kitty Hawk, Fred?

CAPCOM That's affirm.

KITTY HAWK For the POO and ACCEPT.

CAPCOM That's POO and ACCEPT, Kitty Hawk.

KITTY HAWK Okay. You have POO and - you have POO and ACCEPT, Houston. I'm ready to copy pads.

CAPCOM Okay. First pad, SPS G&N, 36116, minus 081, plus 019, 105, 51, 4811, plus 00702, plus all zips, minus 00296, 000, 130, 359, 00633, plus 00555, 00762, 004, 00629. The rest of the column N/A, serious and (garbled) 127, 148, 015, 2 jet 16 seconds, quads B and D.

KITTY HAWK Okay, Fred. Copy circ SPS G&N, 36116, minus 081, plus 091, 105, 51, 4811, plus 00702, all zips, minus 00296, 000, 130, 359, 00633, plus 00555, 00762, 004, 00629. I'm seeing (garbled) the sextant star serious and (garbled) 127, 148, 015, 2 jet 16 seconds, quads B and D.

CAPCOM Okay. That was a good readback, Kitty Hawk and Antares did you copy the NOUN 33 and NOUN 81.

ANTARES That's affirmative. That's the VERB (garbled) and delta VC. (garbled)

CAPCOM Okay, Kitty Hawk. We'd like you to get the steerable again. Pitch minus 86, yaw 251 and F OMNI for Antares.

ANTARES Okay, Fred. Your at OMNI and please confirm again the sign of delta VC for NOUN 84.

CAPCOM Okay. Delta VC is a minus 00296.

ANTARES Understand. Minus 00296.

CAPCOM Okay. And Kitty Hawk, Kitty Hawk, Houston.

KITTY HAWK Go ahead, Houston.

END OF TAPE

KITTY HAWK Go ahead, Houston.

CAPCOM Okay, I got some more data here for you, map update T24.

KITTY HAWK Okay, which one you want?

CAPCOM Okay, first S omni for Antares and I got a map update graft 13.

KITTY HAWK Kitty Hawk's ready to copy map update.

CAPCOM Okay, 180 crossing at 1055118.

KITTY HAWK 1055118.

CAPCOM Okay, next, the P24 landmark track.

KITTY HAWK Okay, go ahead.

CAPCOM Okay, this is 14-1, 1064928, 1065418, 1065558, 1065646, south 2 miles.

KITTY HAWK Okay, 14-1, 1064928, 1065418, 1065558, 1065646, south 2.

CAPCOM Good read back. Antares, Houston.

ANTARES Go ahead, Houston.

CAPCOM Okay, I got a PDI 0 pad here for you Ed, and would you verify your F OMNI?

ANTARES I'll verify F OMNI but we're doing a P52 right now. Could you hold it?

CAPCOM Okay, we only got about 4 minutes and 18 seconds til LOS, now.

ANTARES Okay, Fred, ready to copy PDI 0.

CAPCOM Okay, and some of this is for Kitty Hawk as well. You ready to copy, Stu?

KITTY HAWK I'm standing by Fredo.

CAPCOM Okay, PDI 0 alpha 10647257, brovo plus 01019 plus all zips plus 00017 01390 plus 00079 01019 036 000 288 plus 01018 plus all zips plus 00029, charlie 107 483000 delta 10935 all zip and the throttle profile so far is 10 percent for 15 seconds, 40 percent for the remainder of the burn.

ANTARES Okay, read back. 106472457, brovo plus 01019 plus all zeros plus 00017 01390 plus 00079 01019 036 000 288 plus 01018 plus all zeros plus 00029 107, this is Charlie now, 107 483000 delta 10935 all zeros, throttle profile 10 percent 15 seconds remainder at 40.

CAPCOM Good read back, Ed.

KITTY HAWK And Kitty Hawk copies.

CAPCOM Roger, and Kitty Hawk, you are go for circ.

KITTY HAWK Roger, go for circ. And, Fredo, I assume you're through with the computer.

CAPCOM That's affirm, it's your computer, Kitty Hawk.

CAPCOM Antares, Houston.

ANTARES Go ahead, Houston.

CAPCOM Okay, before you go around the corner

CAPCOM here, or after you go around the corner would you select secondary transmitter receiver on the S band and try us on that one when you come back around.

ANTARES Is that for Antares?

CAPCOM That's for Antares.

ANTARES Okay, we'll get it going around the corner.

CAPCOM Roger, Ed.

ANTARES Houston, clarify, secondary transponder.

CAPCOM And Antares, Houston, that's secondary transmitter-receiver stick on the primary power amp.

PAO This is Apollo Control. We've had loss of signal. Apollo 14 nearing the end of the 12 lunar revolution. Earlier in this front side pass, one of the first items was the soft undocking which occured in actual time at 104:28:01. The undocking was done in a radial direction to minimize the perdibations to the spacecraft trajectory caused by the mechanical unlinking of the two spacecrafts. Everyone was quite happy with the way the undocking took place in view of the earlier apparent problems with the probe and drogue during translunar coast. Shortly after the undocking the lunar module crew of Mitchell and Shephard ran through the descent propulsion system throttle checks starting at 104:40. They photographed and observed the landing site Fra Mauor and midway through this pass and Mitchell made the comment that it quote, "looks just like the map". Toward the end of this revolution, Stu Roosa was given a go for the circulization maneuver that he will make in some 24 minutes from now, the ignition clock counting down to the CSM burn which will put the command service module back into a near circular lunar orbit. That maneuver is now scheduled for a ground elapsed time of 105 hour 51 minutes 48 seconds. The velocity change will be posigrade 76.2 feet per second which will raise the command service module paricynthian to 55.5 nautical miles, apacynthian as 63.3. This is biased somewhat so that at the time of rendezvous, when the lunar module ascends from the surface to rendezvous with the command and service module the orbit will have modified itself to near circular at 60 nautical miles. We show acquisition of signal at the start of the 13th lunar revolution in some 44 minutes now. Count down to the CSM circularzation burn now 23 minutes 23 seconds. At 105 hours 28 minutes ground elapsed time, this is Apollo Control.

END OF TAPE

PAO This is Apollo Control, 106 hours 11 minutes ground elapsed time. Some 52 seconds away from acquisition in this 13th lunar revolution of Apollo 14. At this time the command module should have circularized to about 16 nautical, leaving the lunar module in the 60 by 8 eliptical orbit. Upcoming on this revolution is pressurization of the descent propulsion system. Our checkout of the landing radar on the lunar module. Checkout of the landing point designator which is a grid device on the commanders window which allows him to sight in on the landing point using angles given to him by the lunar module computer. Let's pick up air to ground now.

CAPCOM Okay. You're way down in the mud, Stu. Can you get us a high gain pitch minus 71, yaw plus 175, and use the normal acquisition routine.

KITTY HAWK Okay. How now, Fred.

CAPCOM Loud and clear.

KITTY HAWK Okay. The burn was on time. It was a G&N shutdown with a 2 foot per second over burn. I backed that off 1 foot by residual master trimming for a minus 1.0 minus 0 plus .5. The attitude in which I trimmed was 353127 005. CMP shows the orbit 63.9, 56.0.

CAPCOM Okay. Kitty hawk, the high gain yaw is 197 and copied burn on time G&N shutdown, downs 85 after trim were minus 1.0, minus 0 plus 0.5. And, you trimmed at attitude 353127005 and you ended up with a 63.9 by 56.0. And did you give a Delta-VC.

KITTY HAWK The Delta-VC was a minus 14.7 after prior to trim, and as I was cleaning up the main bus ties it jumped around a little bit. And, after trim it's reading a minus 12.8. It's really doesn't figure too closely; I backed off 1 foot.

CAPCOM Roger.

CAPCOM Antares, Houston.

ANTARES Houston, Antares. How do you read?

CAPCOM Loud and clear. We'd like to get to the quantity switch off.

ANTARES Okay. Quantity off.

CAPCOM Kitty Hawk, Houston.

CAPCOM Kitty Hawk, Houston. Go OMNI bravo. Would you relay Antares.

ANTARES Roger, Ed.

ANTARES Kitty Hawk to OMNI bravo.

ANTARES Houston, Antares. Ready with the down range switches.

CAPCOM Okay. Go ahead now.

ANTARES Okay. NOUN 93 plus 097 plus 062 minus 013 GET 105 26 40 LPD cal at 0, elevation down 1 degree.

CAPCOM Okay. Antares, copy. NOUN 93 plus 097 plus 062 minus 013 and you torqued at 105 to 640 LPD cal

CAPCOM 0, elevation down 1, and I'd like to get from Ed the EGS gyro cal numbers 544 through 546.

ANTARES Okay. You have your initial numbers don't you, Fredo?

CAPCOM Stand by.

KITTY HAWK Houston, Kitty Hawk. I've started a charge on battery b.

CAPCOM Roger, Stu. And, Ed, I guess we need both the initial and the final.

ANTARES Okay, I'll read the initial first, 540 minus 10 41 plus 0 542 plus 02 544 minus 06 545 minus 23 546 minus 187. The cal numbers 540 minus 10 541 minus 1 542 plus 2 544 minus 07 545 plus 0 546 minus 161.

CAPCOM Okay. We copy Antares.

ANTARES Okay.

CAPCOM Kitty Hawk, Houston. We'd like POO and ACCEPT.

KITTY HAWK Okay. You have it.

CAPCOM Antares, Houston.

ANTARES Antares, we're proceeding with a DPS pressurization checkout.

CAPCOM Okay. And, Antares, we're showing the abort bit set again, and we're working on a procedure to reset it. And, also, another procedure to lock it out after starting PDI.

ANTARES Okay. That'll be great, thank you.

ANTARES We're pressing off with DPS dip pressurization.

CAPCOM Okay. Antares, you can go ahead with the DPS pressurization.

ANTARES Okay.

CAPCOM Antares, Houston.

ANTARES Go ahead.

CAPCOM Okay. I see you're back to POO now. We'd like to do a verb 11 now 10 enter, 30 enter, and look at that bit again.

ANTARES Okay. Verb 11 now 10.

KITTY HAWK Houston, Kitty Hawk. Could you (garbled)

CAPCOM Roger, Kitty Hawk. And, while we've got that display up, Ed. Could you tap on the panel around the abort push a button and see if we can shake something loose.

ANTARES Yes, Houston, it just changed while I was tapping there.

CAPCOM You sure tap nicely.

ANTARES I'm pretty good at that.

CAPCOM Okay. Antares, we'd like to kind of sit here a minute and watch it.

ANTARES Okay.

END OF TAPE

CAPCOM Antares, Houston.

ANTARES Go ahead.

CAPCOM Okay, why don't you all proceed on, Ed, with the landing radar checkout.

ANTARES Okay.

CAPCOM Kitty Hawk, Houston. OMNI BRAVO.

ANTARES And, Fred-O, standing by for my update. (garble)

CAPCOM Okay, Ed, I got some stuff ready. Let me check - Kitty Hawk, how do you read me?

CAPCOM Okay, he's way down in the mud Antares would you relay OMNI BRAVO.

ANTARES Roger. Kitty Hawk, Houston likes OMNI BRAVO, please.

KITTY HAWK Roger. I have OMNI BRAVO.

CAPCOM Beautiful.

ANTARES Okay.

CAPCOM Well, I guess you'll have to relay to him, Ed, if I don't get through to him. You ready for PDI?

ANTARES Roger. Fred, he's reading you loud and clear and he is on OMNI BRAVO.

CAPCOM Roger. Okay, here we go. INDIA.

ANTARES I'm ready with the PAD.

CAPCOM Roger. INDIA. And Kitty Hawk, Houston. Try OMNI ALPHA.

KITTY HAWK Rog. I've just come up ALPHA. How do you read me?

CAPCOM A little better; not much. Here we go with PDI PAD. INDIA 108422751, 0923, plus 00004, 001, 113, 000 plus 56963, PDI early. JULIET 113 32 all zips. PDI late KILO 111 33 all zips. You ready for no PDI plus 12?

ANTARES Okay, no PDI plus 12.

CAPCOM Okay, ECHO 108 55 all zips, fox trot plus 01114 plus all zips.

ANTARES Fred-O, let's start over again.

CAPCOM Okay. Over again on the no PDI -

ANTARES Kitty Hawk is not reading.

CAPCOM Okay, standby one, Ed.

ANTARES Kitty Hawk is not reading you and he'll have to pick them up later.

CAPCOM Okay, we'll press on then, Ed. You can relay to him. No PDI plus 12, ECHO 108 55 all zips FOXTROT plus 01114 plus all zips minus 00750 01468 plus 00072.

CAPCOM Standby one.

CAPCOM And, DELTA V R

ANTARES Kitty Hawk (garble) Houston, why don't you try it once more and we'll read back.

KITTY HAWK Yes, I'm reading you now, Fred.

CAPCOM Okay, Stu. DELTA V R Ed, 01343 044 000 278 plus 01124 plus 00001 minus 00734 (garble) 111 49 all zips.

CAPCOM hotel 113 32 all zips. Throttle profile 10 percent for fifteen seconds 40 percent for the remainder. Want to go ahead and get the read back on those first and then I'll give you T2 and T3.

ANTARES Roger, I'll read back in the order you gave them. INDIA 108 422751 0923 plus 00004 001 113 000 plus 56963. JULIET 113 82 all zeroes, T-BONE 111 33 all zeroes and now no PDI plus 12, echo 108 55 all zeroes FOXTROT 01114 plus all zeroes, and let's go back to FOXTROT again. That's a plus 01114, plus all zeroes minus 00750 01468 plus 00072 01343 044 000 278 plus 01124 plus 00001 minus 00734, 11 - this is gall 11149 0000 HOTEL 11332 all zeroes throttle PROFILE 10 percent for 15 seconds the remainder at 40.

CAPCOM Okay, a good read back, Ed. You ready for T2?

ANTARES Okay, T2.

CAPCOM Roger, T2 LIMA 109 04 3406. METRO 113 32 all zips and T2 is at PDI plus 22 minutes and 7 seconds. T3 NECTAR 110 54 2587.

ANTARES Okay, Fred-O. LIMA 109 04 3406. METRO 113 32 all zeroes T2 dash 1 is at PDI plus 22 07. NECTAR is 110 54 2587.

CAPCOM Okay, that was a good read back ED.

END OF TAPE

ANTARES - - 87.
CAPCOM Okay. That was a good readback, Ed.
KITTY HAWK And Houston, Kitty Hawk, got all the pads.
CAPCOM Roger, Kitty Hawk.
CAPCOM Antares, Houston. Could you give us P00 and data.
CAPCOM Antares, Houston. How do you read?
ANTARES Go ahead, Houston.
CAPCOM Okay, Ed. We'd like P00 and data so we can start uplinking you.
ANTARES Okay.
ANTARES Okay. You have it.
CAPCOM Roger, Antares.
PAO This is Apollo Control. By way of explanation of some of the discussion between the ground and the crew of Apollo 14 regarding the strange signal in the lunar module computer. It seems that during revolution 12, front side pass, a spurious bit in the LM guidance computer registers were telemetered to the Mission Control Center here and they showed that an abort command was issued while the computer was in program 52, which is inertial measurement unit realinement program. During program 63, 64 and 66 which are concerned with the descent and power descent and landing programs, such an electronic spook would certainly cause an unintentional abort. One cause of this spurious bit in the software program could be contamination in the abort switch itself. Meanwhile, Massachusettes Institute of Technology, prime contractor for the Apollo guidance system, has evolved a procedure for inhibiting the abort command in the primary guidance and navigation system, which in effect would tell the computer to ignore abort - or abort stage commands. Early in this revolution, revolution 13, in the front side pass, the abort command bit again showed up in the DSKY or display keyboard readouts, both onboard and here in Mission Control, but they disappeared when the crew tapped the abort switch. Standing by on air/ground for further conversation on lunar orbit 13. This is Apollo Control at 106 hours 45 minutes ground elapsed time.
CAPCOM Antares, Houston. The computer is yours.
ANTARES Okay.
CAPCOM Antares, Houston. And don't uplink too fast, proceed on (garbled).
ANTARES Okay.
ANTARES Houston, Antares. The LPD altitude shows 49 thousand.
CAPCOM Roger, Antares. LPD altitude 49 thousand.
ANTARES That's correct.

END OF TAPE

ANTARES Okay, I have Cone Crater, Triplet, and Doublet. They all look just like they're supposed to.

CAPCOM Very good, Al.

ANTARES And stars look like, right down there right straight down (garble) got them, yes, sure do. I think we'll know it next time, Fredo.

CAPCOM Very good.

ANTARES There they were right below us, big as life.

ANTARES Houston, Antares, the landing sun angle looks very good for the next time around.

ANTARES Yes Sir, Fredo, the LNA really look clear today.

CAPCOM Really does, huh?

CAPCOM Fredo, I guess you'll advise us on that abort that we can get around next time.

CAPCOM Yeah, I'm working up a little spill right now.

ANTARES Good.

ANTARES Okay, Fredo, tracking on 14 1 and you have the data and (garble)

CAPCOM (garble)

CAPCOM Antares, Houston, we'd like you to check the water cep handle and make sure it's all the way in.

ANTARES Okay, Fred, I'll get to it in just a minute.

CAPCOM Okay.

CAPCOM Kitty Hawk, Houston, on the alpha.

END OF TAPE

ANTARES Houston, Antares. I've verified that the water step handle is all the way down.

CAPCOM Roger, Ed.

CAPCOM Okay, Antares, Houston.

ANTARES Go ahead.

CAPCOM Okay, Ed. That bit just showed up again. I wonder if you could try tapping the panel there by the abort switch again.

ANTARES Okay.

ANTARES Anything yet, Fredo?

CAPCOM Okay, Ed. You did good work again.

ANTARES Okay.

ANTARES Houston, Antares.

CAPCOM Antares, Houston. Go ahead.

ANTARES Hello Tom. Do you think we're going to come up with something on this problem with the abort button?

CAPCOM Roger. We're working it right now and also MIT working it and needless to say we're busy here but we think we got a solution.

ANTARES Good enough. Something - is it something like a butter ball -

CAPCOM Well, we don't know yet. We got about 19 minutes till loss of signal here so we'll have something to you before then and we'll have some time to pick it up on the other side.

ANTARES Thank you, Tom.

CAPCOM Roger.

CAPCOM Kitty Hawk, Houston.

KITTY HAWK Go ahead, Houston.

CAPCOM Roger. Got a map update in rev 14.

KITTY HAWK Okay. Go ahead.

CAPCOM Okay. 180 degrees, 107:49:38, LOS 107:24:39.

KITTY HAWK Okay. 180, 107:49:38, LOS 107:24:39.

CAPCOM That's affirmative. And we have an LTC photo pad 16. Roll 000, pitch - -

KITTY HAWK Okay.

CAPCOM 303, yaw 000, T start 108:37:36, T stop 108:47:43. Range 1, 91.4, range 2, 91.1. Over.

KITTY HAWK Okay. LTC pad 16, 000, 303, 000, 108:37:36, 108:47:43, 91.4, 91.1. Sounds like you got the first team in down there.

CAPCOM Yes. We got the original capcom down here. Okay. Let me give you an LTC pad for target 12 also.

KITTY HAWK Okay.

CAPCOM Okay.

KITTY HAWK Stand by just one.

CAPCOM Roll, 000; - -

KITTY HAWK Okay. Go ahead.

CAPCOM Roger. Roll 000, pitch 162.4, yaw 000, T start 108:53:29, T stop 108:54:29, range 94.1. Over.

KITTY HAWK Roger. 000, ;08:53:29, 108:54:29, 94.1. And I've got a question on the high con. This morning Bruce started to give me some procedures they wanted me to troubleshoot with. He never finished and we never got a chance to get back together again and I think we ought to pick out a convenient time here and run over those. I've got the camera out and soon as I get a chance I'll try to run through the procedures.

CAPCOM Okay. We've got that down here in a stack. We'll get by - back to you momentarily on it. One correction on the range it was 94.4.

KITTY HAWK Okay. 94.4.

CAPCOM Right.

KITTY HAWK On LTC photo pad 12.

CAPCOM Roger.

CAPCOM Kitty Hawk, Houston. I tell you we're going to keep the air clear with you most of the time until LOS so we can be talking to Antares. Over.

KITTY HAWK Roger. I was thinking maybe of him bringing up the other loop to talk to me on.

CAPCOM Yes. Okay. We're kind of busy. We'll see about it.

KITTY HAWK Okay. Whatever's good for me.

CAPCOM Antares, Houston.

ANTARES Go ahead.

CAPCOM Okay, Ed. You and Al ready to listen to some words on the abort bit business.

ANTARES Roger. We sure are. And did you get our torquing angle?

CAPCOM That's affirm, Ed. Okay. And before I start in here would you try tapping the panel again. The abort bit came back.

CAPCOM Okay. You tapped it right again, Ed.

ANTARES Okay.

CAPCOM Okay. I guess you've summised already that we had some sort of a contamination in the abort switch. And the implications of that bit being set, I guess you also realize means that 63 we're going to find ourselves in P70. Okay, so - Say again, Ed.

CAPCOM How do you read me now, Ed?

ANTARES That's affirm. We read you. Go ahead.

CAPCOM Okay. Did you hear my last about the implications of that bit being set?

ANTARES That's affirm. We understood.

CAPCOM Okay. So directly I'll be giving you some - -

ANTARES That's affirmative.

CAPCOM Roger, Al. I'll be giving you some changes to the time line here whereby we'll be starting initiating PDI and PNGS at hold and manual throttle. The next consideration is if the bit sets during ullage, you're procedure will be stop push button to set and exit P63 or rather P70 in this case. We'll have further words on how you're to do that exit.

ANTARES Okay. We understand the strategy I believe.

CAPCOM Okay. Then we got some more. Assuming we get by ignition, we'd like you to copy the following procedures.

END OF TAPE

ANTARES Stand by one, Fred. And, while he's getting something to write on, I understand that you're going to be looking at the vector rate the ullage cycle.

CAPCOM Negative, Al. You'll get the program switch to P70 which is your cue. We'll be looking at it down to pass the word on

ANTARES Okay. I misunderstood you. I understand that we just go a rate of (garbled). Okay.

CAPCOM Okay. I just got corrected, Al. The switch to P70 would occur at ignition, at ignition.

ANTARES Okay. I understand.

ANTARES Okay, Fred. Do I have enough room to write just in the space on my PDI chart?

CAPCOM Stand by. Okay. You mean the timeline, Ed, or your pad?

ANTARES The timeline.

CAPCOM Roger, Ed.

ANTARES Fred, go ahead with it.

CAPCOM Okay. The procedure is Verb 25 Noun 7 enter, 105 enter, 400 enter, 0 enter.

ANTARES Okay. I'll read back. Verb 25 Noun 07 enter, 05 enter, 4000 enter, 0 enter.

CAPCOM Okay, Ed. It's Verb 25 Noun 7 enter, then 105 enter, 400, 400 enter, 0 enter.

ANTARES Okay. Verb 25 Noun 07 enter, 105 enter, 400 enter, 0 enter, and when do I do this.

CAPCOM Okay. You can do this as soon as you can after ignition. We're trying to get this is before there's any chance of the bit getting set in this interval.

ANTARES Okay. We have to let P63 call up normally, get ignition and then hold manual throttle, and then reset the disk hopefully before it gets, or rather lock out the bit hopefully before it gets set. Is that right?

CAPCOM That's affirm, Ed. And, if somehow you get hung up a little further down stream, you can go ahead and throttle yp manually at 26. I'd like to explain the implications of this. What we've done then is locked out P70 and P71 so any aborts have to be done on the AGS. And, while you got the card handle you can ... I'll give you something that'll reenable P70 and P71.

ANTARES Okay. We got DAP and go ahead with your work.

CAPCOM Okay. It's Verb 25 Noun 7 enter, 105 enter, 400 enter, 1 enter.

ANTARES Okay. Read back, Verb 25 Noun 07 enter 105 enter 400 enter 1 enter, that's all straight forward and out.

CAPCOM Okay, Ed. Once we're by that initial disabling depth, we got it made. We'll comment that it's in

CAPCOM the process of your key and that end. The abort sets will be in P70 and if that happens we need the same as before ignition. We'll need to stop button set and exit the program and we'll try it on the second pass.

ANTARES Okay. Are you going to give me the words on exiting now.

CAPCOM Okay. They're still working on that. Right, and Antares, Houston.

ANTARES Go ahead.

CAPCOM Okay. Assuming we get through the dis-abling procedure after that time you can go back to auto on the throttle and the abort control switch.

ANTARES I understand, Fredo. Thank you.

CAPCOM Okay. One other word. The same holds for any surface no stay. The abort there would have to be on AGS.

ANTARES Understand, Fred.

CAPCOM Okay.

KITTY HAWK Roger, we understand. Sounds like you all have been busy down there.

PAO This is Apollo Control. We've had loss of signal with the lunar module Antares. We still have a little 4 minutes remaining though with the command module and Stu Roosa.

CAPCOM Roger, houston.

KITTY HAWK (garbled)

CAPCOM Stu, I have some more words on the TOPO camera that may help a little. We've got about 5 minutes left to get the dejan if you're ready to discuss it.

KITTY HAWK Okay, Gordon. Stand by just one. Let me copy down my (garbled) there.

CAPCOM Okay.

KITTY HAWK It'll keep. Go ahead. Tell me what I ought to do.

CAPCOM Okay. By way of general discussion evidently by recreating the noise here on the ground, the only way we can recreate the noise is by causing a dc power current limit problem to the camera. An indication on board there that this is ... that would really verify that it's a dc power problem would be a flickering power on light while you're getting that clacking sound. But, any rate, the consensus here is the one is the camera is making the clacking sound you're not getting good pictures. I believe you got the ... about 5 steps about checking the panel 227 cable and for pin damage and reconnecting and switching the non-essential bus to main A. Is that correct? Did you get those steps. Over.

KITTY HAWK Gordon, you dropped out are you with me?

CAPCOM Roger. Stu, where did I drop out?

KITTY HAWK Okay. Both from you and Bruce all I've got is a check the pins and the connection to see if things look alright and that's as far as I've got with either one. And, to switch the nonessential power to the other bus.

CAPCOM Okay. That's all we can do to try to improve the dc power problem. However, if you have time to verify that it's not a camera shutter being out of synchronization. You could shut the shutter to 1/200th and remove the magazine and visual examine the shutter curtain inside to see that the sweat in the shutter curtain is within 1 inch from 1 of the side rails, either side. And, at that time examine the spocket area from visible tears in the shutter curtain spocket holes. After checking the (garbled) on one side reinstall the magazine and use magazine W for this. And, actuate 1 single frame and remove the magazine and check that the slit is still positioned over to the side. If the slit is remaining in the center, then the camera shutter is completly out of sync and the camera is essentially unusable. Is that clear? Over.

KITTY HAWK Yes, I believe I got that, Gordon. I'll put in magazine W 1200 and I guess fire a frame, remove the magazine, look at the slit, see if it's an inch from the side rail, and I guess I'll see some sprockets in there, and then if it is 1 inch, I'll put the magazine back in, fire another frame, check that the slit is still there, if it's out in the center somewhere then we've got big problems.

CAPCOM Okay. We're just about to LOS. This looks okay, and prepare the camera according to the normal procedures. Set the mode switch to AUTO and do not use stand by Position. Start the camera by turning the power on while the switch is in AUTO.

PAO This is Apollo Control. We've now had lost of signal with the command module Kitty Hawk.

CAPCOM And, then back on and that may stop it.

PAO Spacecraft communicator Gordon Fullerton attempting to continue talking to the spacecraft apparently did not hear network sing out we've had lost of signal. During the latter portion of that front side pass the lunar module crew will have passed up to them the procedure whereby they can bypass the spurious bit in the lunar module computer, which could and would cause an abort during power descent. Essentially, what it amounts to is considerable amount of stroking of the keyset of the DSKY to enter numbers into the LM guidance computer. Verb 25 Noun 07 etc. which would disable program 70 which is descent propulsion system abort and program 71 which is ascent propulsion system abort. If we do this after ignition on a normal P63 your program 63 but before they throttled up beyond 10 percent which occurs about 20 seconds - 26 seconds after ignition. Having locked

PAO out program 70 and 71, abort could not be made on the primary guidance system, but on the secondary guidance system in the LM the abort guidance system as it's called AGS. We're still some 40 minutes 56 seconds away from acquisition of the lunar module again on rev 14. The last rev before landing. And, 44 minutes 11 seconds away from acquisition of command module Kitty Hawk. At 107 hours 27 minutes ground elapsed time this is Apollo Control.

END OF TAPE

PAO This is Apollo Control 107 hours 45 minutes ground elapsed time. Apollo 14 spacecraft now separated into lunar module, Antares, and command module, Kitty Hawk. Now behind the Moon nearing the start of the 14 revolution. There's about 21 minutes until the lunar module appears from behind the Moon and is picked up by the ground tracking stations and 25 minutes until the command module is again picked up. To recapitulate the current situation with the LM guidance computer, the problem first cropped up during revolution 12 on the front side pass, when a spurious bit or number or digit cropped up in a readout on the ground, telemetered to ground from the spacecraaft in the LM guidance computer. This spurious bit or electronic spook showed that an abort command was issued while the computer was in program 52. Which, in program 52, is actually an inertial measurement unit realinement. Had it been during an engine maneuver where the engines had been ignited, either say in power descent or another phase of the mission involving thrusting, the abort command would have indeed affected the engines. However, in the platform alinement, such as P52, it did nothing other than just show up on the registers on the displays here in mission control. But also on the DSKY or the display keyboard in the spacecraft cabin. During program 63 and 64 and 66, the three programs which are used for the power descent and landing on the lunar surface, such an electronic spook would cause an unintentional abort which is highly undesireable in this mission. Contamination in the abort switch itself is a suspected cause of the indication. Massachusetts Institute of Technology who is prime contractor for the Apollo Guidance System, has evolved a procedure for inhibiting the abort command in the primary guidance and navigation systems which in effect would tell the computer to ignore abort or abort stage commands. Essentially, this procedure as submitted by MIT is a series of numbers which would be entered into the computer by the lunar module pilot after power descent ignition of the descent propulsion engine. He would have all these numbers to enter into the computer prior to the time of throttle up beyond 10 percent of myout power, which is about 26 seconds. The numbers would in effect disable the abort program which is program 70 on the case of descent propulsion engine and program 71 on the ascent propulsion. It would lock out these two programs, however, an abort further on down into the descent phase could only be made on the abort guidance system and not on the primary guidance system. Twice in the just completed revolution 13 front side pass, the abort command bit or electronic spook again showed up on the DSKY onboard and again here in the control center where DSKY readouts are available from telemetered displays. Again, the abort

PAO command bit disappeared when the crew tapped the abort switch. That, in affect, summarizes the current situation with the mysterious abort signal cropping up in the lunar module computer. We're now 17 minutes 3 seconds away from acquisition of Antares, 20 minutes 25 seconds away from acquisition of Kitty Hawk as they come around on their 14 lunar revolution. The network is conducting test through various tracking stations before we have acquisition. And at 107 hours 50 minutes ground elapsed time, this is Apollo Control.

END OF TAPE

PAO This is Apollo Control 108 hours 6 minutes ground elapsed time. Coming up on the start of REV 14 in the mission of Apollo 14. We've got about 46 minutes, as you were, 42 seconds until acquisition of signal with lunar module Antares and about 4 minutes even until command module Kitty Hawk comes over the hill. All the displays here in the front of Mission Control have been changed from the lunar orbit tracking chart, to the XY plotter type of presentations for the descent phase. Ignition for the power descent phase of lunar module descent to the surface will be at 108 hours 42 minutes 27.5 seconds. We have had acquisition of the lunar module. We'll standby for any conversation as they come over the hill. Ignition countdown clock now showing 34 minutes 44 seconds to PDI ignition.

CAPCOM Antares, Houston.

ANTARES Go ahead, Houston.

CAPCOM Okay, read you loud and clear. And we got some more procedures to pump up that are going to alter what you already copied and Ed might ought to get out something a little bigger than the DPS card to write this down.

ANTARES Okay, standby. Let's get locked up on the main load first.

CAPCOM Okay.

ANTARES In the meantime, do you still read me?

CAPCOM Roger, Al.

ANTARES Okay, ascent batts went on at 108 01 45.

CAPCOM Roger. 108 01 45.

ANTARES And NOUN 93 as follows plus 40 minus 52 minus 16.

CAPCOM Okay. Copied plus 40 minus 52 and minus 16.

ANTARES That's right. GC 1070830.

CAPCOM 1070830.

CAPCOM Okay, Antares, Houston. And before we start here, the BIT is set again could you - you still there Antares?

ANTARES Okay, I believe we're locked up now, Houston.

CAPCOM Okay, Antares, Houston. If you get locked up there then you might just stay in slew.

ANTARES Okay, and we'll lock up in AUTO track now.

CAPCOM Okay. I don't know if you heard the BIT appeared to be set again and we need you to rap on the panel again by the ABORT button.

CAPCOM Okay, Antares, the BIT is reset. And are you still reading us?

ANTARES That's affirmative.

CAPCOM Okay, Al, the reason for some changes I'm going to feed you up on the procedure is we found in the interim of time around the back side there, a little slicker

CAPCOM way of doing this and what it does is it allows us to start PDI in the right configuration, switch wise and we can make an entry before we get the ullage or ignition that will get us by that problem there, Ed.

ANTARES Roger, very good. Go ahead, we're ready.

CAPCOM Okay, in the interim here, Anteres, could you give us POO and data so we could start getting the uplinks set in.

ANTARES Okay, you have POO and data.

ANTARES And, Fred, I am having to stay on the OMNI (garble)

CAPCOM Okay, Ed. The first is after P63 selected and your to NOUN 92, which in the time line is right up - correction NOUN 62 - which is right aftter your enter at minus 4 minutes

CAPCOM Okay, Antares, we've got a lot of static in the background here, how do you read?

ANTARES Loud and clear, keep going.

CAPCOM Okay, after the enter and check DET, Ed, we need a VERB 21 NOUN 1 enter 1010 enter 107 enter.

ANTARES Okay, Fred, I understand as for P63 is NOUN 62 about 4 minutes we want to enter VERB 21 NOUN 1 101 enter 107 enter.

CAPCOM Antares, Houston. Correction on your readback. It's VERB 21 NOUN 1 enter 1010 enter 107 enter.

ANTARES Roger, got you. 10 10 enter 107 enter.

CAPCOM Okay, that's correct. From there on you can follow the nominal procedures through ignition. After ignition -

ANTARES Okay, Fred.

CAPCOM Okay, after ignition at plus 26 seconds on page 6 we need MANUAL throttle up and so you don't mis-constrew what I'm saying we're - we had this AUTO switch in AUTO but we're going to manually over run it to full throttle at 26 seconds.

ANTARES Okay. Understand that at ignition plus 26 we will MANUAL throttle up thus overriding the AUTO.

CAPCOM That's correct. Okay after we get by throttleup it's VERB 25 NOUN 7 enter 101 enter 200 enter 1 enter and this will enable guidance and give you steering at that time.

ANTARES Okay, understand after throttle up, we have a VERB 25 NOUN 7 101 enter 200 enter 1 enter and this enables guidance steering at that point.

CAPCOM Roger. Okay the next entry. VERB 25 NOUN 7 enter 105 enter 400 enter 0 enter.

ANTARES Okay, understand VERB 25 NOUN 7 enter 105 enter 400 enter 0 enter and then it looks like the procedures you gave me earlier.

CAPCOM That's right, Ed. This'll disable P70 P71. Okay, the next - -

END OF TAPE

CAPCOM - - Ed. So disable P70 - P71. Okay. The next entry VERB 21, NOUN 1 enter, 1010, enter 77 enter.

ANTARES Okay. VERB 21, NOUN 1 enter 1010, enter 77 enter.

CAPCOM Okay. This gets us in the P63 and the mode direct which is - gets us right for landing right on. Now the same words apply if an abort requirement exists. We're going to be on the AGS. And one thing maybe I didn't make clear before is the procedure for reenabling P71. You're not to perform unless you do abort on AGS.

ANTARES Roger. Roger. Understand that we will in the abort situation, we will abort on AGS and use the reenable procedure previously given out.

CAPCOM Okay. And the only other thing I can say is, as you already know, be sure and get you manual throttle up at 26 and after the last entry, Ed, add one more thing, we need throttle to minimum setting.

ANTARES Okay. Got that. The last entry is reserved for commander's throttle minimum setting.

CAPCOM That's affirm. Antares, Houston. We'd like forward OMNI.

ANTARES Antares, you have forward OMNI.

CAPCOM Okay. I'm sorry I cut you out. Say again, Al.

ANTARES Let me just recheck one thing with this new procedure you want us to have the throttle control in AUTO manual throttle. Commander will make the override to full throttle in 26 seconds.

CAPCOM That's affirm and also the mode control switch PNGS in AUTO.

ANTARES Alright, sir. Fine.

ANTARES Fredo, we need a few words on what you want to do with this S-band. I don't think you can fight it all the way down. Can we go with the OMNI?

CAPCOM Stand by.

ANTARES And Fredo, one more question. Is this procedure now stable until such time as we get the - the abort disable to feed in or do we still need to rush right along to get that in.

CAPCOM Ed, this procedure is good as long as we can get by the first entry with the bit not set. That is, the entry right after you get NOUN 62. If you get that in with the bit not set we're in good shape.

ANTARES Okay. Is the bit not set now?

CAPCOM That's affirm. The bit is not set now.

ANTARES Okay. And I'm standing by to (garbled) OMNI any minute.

ANTARES Houston, are you through with the computer?

CAPCOM Antares, Houston. The computer is yours.

ANTARES Okay.

ANTARES Houston, our voice backup is giving us a hell of a squeal.

CAPCOM Go ahead, Antares.

END OF TAPE

CAPCOM Go ahead, Antares.

ANTARES I say our voice backup position of the update (garble) switch has given us quite a squeal. You ready for us to go to upvoice and back up now?

CAPCOM Stand by one, Ed.

CAPCOM Okay, Antares, they're configured now, you can try it one more time, Ed.

ANTARES Okay, (garble)

CAPCOM Roger.

CAPCOM Kitty Hawk, Kitty Hawk, Houston, how do you read me?

CAPCOM Kitty Hawk, Houston, how do you read?

Kitty Hawk (garble)

CAPCOM Okay, you're way down in the mud Stu, we're getting an awful lot of noise, we're going to drop the down link - we're going to drop your downlink and if you call, call two times so we can get it tracked back in here.

KITTY HAWK Okay.

CAPCOM Antares, Houston.

ANTARES Go ahead.

CAPCOM Okay, and since we dropped Kitty Hawk here, we're not going to be in a relay mode for this period so we probably won't get an answer from him, if you call him in two minutes.

ANTARES Okay.

CAPCOM (garble) okay?

ANTARES (garble). How do you read vox, Houston?

CAPCOM Okay, Al, you're about 2 by 2.

ANTARES How do you read?

CAPCOM Okay, Ed, you're about 3 by 3 there. You're still getting a lot of background static there.

ANTARES Okay.

CAPCOM Okay, now you're loud and clear.

SC (garble) coming up.

SC Very good. Yeah, that looks good. 317 looks good, 383, that looks good. Let's go to 277, that looks good, great. Alright, I can start loading the H pad now. 231 by 56963 - 6963. 240 into the heap by 96963.

SC 8254.

SC 8254 plus 05428.

SC Thank you

SC 05428.

SC 6.00037.

SC 00037, 6.00037.

SC 62 minus ...

SC 62 minus ...

SC 00147

SC 000147, 62 minus 00147.

SC 404

SC 404 ...

SC minus 12345.

SC minus 12345. Okay, that's entered, let me run back ...

END OF TAPE

ANTARES Okay. That's entered. Let me run back now very quickly VERB 31 readout 56963. That's good. 240 readout, 56963, that's good. 254, readout, check me on these, plus 505428. 61 readout, plus 00037.

CAPCOM Looks good.

ANTARES 262 readout, 900147.

CAPCOM Okay.

ANTARES 404 the large negative number. It's 12345.

CAPCOM Good.

ANTARES That's good. Okay. Let's try it - -

ANTARES Anything on minus 10.

ANTARES Okay. We're a little ahead of time.

ANTARES Okay, I think, Houston, what we'll do just before we enter on the final trim is call you to see if the vent is set at that time. Do you concur?

CAPCOM Okay. It doesn't matter, Al. You can go ahead and make the enter and make the first entry at that time after you get NOUN 62 up.

ANTARES Okay. But we seem to be really successful at resetting by tapping so if it shows prior to that time, then let us know.

CAPCOM Okay.

ANTARES Then let me readback. At 4 minutes that goes in ignition plus 26 manual throttle. Alright I'll put these other calls in just as quick as I can get them in.

ANTARES Yes. One right after the other. I'll tell you what's going on.

ANTARES Okay.

CAPCOM Antares, Houston.

ANTARES Go ahead.

ANTARES Go ahead.

CAPCOM Okay. I see you're already past that point and we need the throttle to - throttle control to AUTO.

ANTARES Okay. We're - we'll get it - we've got it on our checklist, Fred. We're not quite there yet.

CAPCOM Okay, Ed. And one other tiing, the value of 231 is changed, Ed, so we need you to reload 231 and 240 with the following number. Plus 56978. That's an update to your ROS.

ANTARES Roger. 56978 cleared 231, 56978. Enter 40 with 56978. Entered. Okay, Fred. They are in.

CAPCOM Roger, Ed.

ANTARES In AUTO commander. AUTO again. It went through without comm. I think we ought to check out abort and abort stage reset. (garbled) lose control 3.

ANTARES Okay. Did you get your circuits back to the gimbal ACT.

ANTARES Yes. They're all set.
ANTARES Okay. Let me check your ...
ANTARES I already checked yours.
ANTARES Okay.
ANTARES Okay. PNGS AUTO and AGS AUTO. Push button to reset.
ANTARES Do you have (garbled) AUTO. We got the configuration target now down to - -
ANTARES Here.
ANTARES Down to there. Okay.
ANTARES We're through with that card.
ANTARES Okay.
ANTARES Back on this one.
ANTARES Roger. We have 10 minutes.
ANTARES Standing by for the landing radar.
ANTARES I'm a ligtle early here.
ANTARES Fred, if you're going to give me any words on the antenna, I'd appreciate them very soon.
CAPCOM Okay, Antares. The OMNI is GO.
ANTARES Okay. We're on the ONNI. 10 minutes give me circuit breaker landing radar closed. Check the altitude transmitter.
ANTARES Okay. You can close in in that velocity transmitter is reading 4.0 and the altitude transmitter is reading 4.0.
ANTARES Okay. Let's call P63.
ANTARES 62.

END OF TAPE

ANTARES ... it looks like it's about 1 second off. Right on. Okay. Timer's set right on. And we're looking for NOUN 63, go ahead.

ANTARES Hold on. Okay the DPS burn card is all complete.

CAPCOM Antares, Houston.

ANTARES Go ahead, Fred-O.

CAPCOM Okay, somewhere down a little past lo minutes, we're going to need to switch to F OMNI. We'll try to give you a call on it.

ANTARES Okay, if I hear it I'll switch it. If I hear it start to break up I'll switch it unless you, Fred-O would rather I'll wait for the call.

CAPCOM Okay, you can go ahead and initiate it on your own, Ed, I think that'll work out better.

ANTARES Okay. Okay, the FTAI GO. 111 and about (garble) (garble) looks good we'll do the CDU's. Your zeroes in?

ANTARES Roger. Standying by.

ANTARES Your zeroes complete.

ANTARES Okay.

ANTARES 400 to plus 30 throusand. Antares, point 10 to plus all zeroes.

ANTARES It is entered.

ANTARES 410 to plus all zeroes is entered.

ANTARES 400 to plus 10 000.

ANTARES Plus 10 000 entered.

ANTARES (garble)

ANTARES Read out 433 at your pleasure.

ANTARES 433 inertial velocity.

ANTARES Okay, we're sitting up final trim waiting for four minutes.

ANTARES VERB 21 901 1010 and a 107 is your first ball.

ANTARES Understand.

ANTARES Okay, we're starting now with 96 on A and 4 on B. Real good. (garble)

MITCHELL Hey, Al, your RCS system looks good.

SHEPARD SM helium 1 and 2 looks good. B tank are still good. And the star tank is good.

MITCHELL EPS system is good. ECS all indications are normal.

SHEPARD Okay.

MITCHELL We're ready.

SHEPARD (garble) A minute and 50 seconds away from final traim.

MITCHELL Okay. All right.

SHEPARD Okay we'll go into final trim in 30 seconds here we'll allow you to get that -

MITCHELL Okay.

SHEPARD Let me do the final TRIM and then you can take it over.

MITCHELL Yeh. Good.

SHEPARD Rather have me put it in?

MITCHELL No, I've got it. I just wanted to adjust this locking collar if it can still reach.

MITCHELL We're there and we are.

SHEPARD Okay, you ready?

MITCHELL I'm ready. Enter.

SHEPARD A enter.

MITCHELL (garble) comes up. That's very good.

SHEPARD NOUN 62 is VERB 21. NOUN 01 enter. 1010 enter 107 enter.

ANTARES Okay, Houston, it's in.

CAPCOM Roger, Antares.

ANTARES Antares is standing by for PDI GO.

END OF TAPE

ANTARES - - for PDI GO.

CAPCOM And Antares, Houston. You're GO for Fra Mauro.

ANTARES Good show, Fredo. Thank you.

ANTARES Thank you. You troops do a nice job down there.

ANTARES Beautiful.

ANTARES Hey, if you watch us reset, we'll flip the page.

ANTARES Let's go.

ANTARES Yes, we got just a minute.

ANTARES Okay. Today all procedures are normal from here on in except the 26 I actuate the manual throttle to full on my side.

ANTARES That's correct. I'll start reentering the DPS after you have throttled up.

ANTARES Okay.

ANTARES Won't have guidance till after I give it to you after the first entry. Okay. We cover everything on that last one?

ANTARES Yes, sir.

ANTARES 10 feet per second (garbled).

ANTARES You're breaking up to me. Would you run us DPS (garbled)

ANTARES Okay. 1670 is full up.

ANTARES Okay.

ANTARES It's a beautiful day in the land of Fra Mauro. Okay, we will bring master arm on along 30 seconds here in case communications (garbled) hit us again.

ANTARES Houston, the master arm is on and the A and B lights are on.

CAPCOM Roger, Antares.

ANTARES Boy it looks good.

ANTARES Mark one minute.

ANTARES Let me read our temperatures coming up. Okay.

ANTARES (garbled)

CAPCOM That's good.

ANTARES How come we got balls.

ANTARES Okay. Our (garbled) is on time.

ANTARES It's in OMNI descent.

ANTARES Average G is on. The descent engine is on.

CAPCOM Roger, Antares.

ANTARES There's altitude and velocity light.

ANTARES R3 looks black.

ANTARES Okay. We're waiting for LH auto aline.

ANTARES R3 looks good.

MITCHELL Ullage.
SHEPARD AUTO ullage.
SHAPARD 4. 3. 2, 1. 0.
MITCHELL Engine.
SHEPARD We have AUTO ignition.
CAPCOM Roger, Antares.
SHEPARD We have an AUTO ignition.
MITCHELL Engine arm override. (garbled) override.
SHEPARD Okay. And the master arm is off.
MITCHELL Alright and that's about 46.
SHEPARD Okay. We'll take the throttle up at 26.
MITCHELL Throttle up.
SHEPARD Okay. We're at full throttle.
MITCHELL The command is down.
CAPCOM Roger, Antares.
MITCHELL NOUN 7, VERB 101.
SHEPARD 1.7.
MITCHELL (garbled) you have guidance. And you have command and throttle.
SHEPARD Okay. We have guidance.
MITCHELL Alright. I'm disabling. VERB 25, NOUN 7 enter, 105 enter.
CAPCOM You're GO at 1 Antares.
MITCHELL 400 enter, 0 enter. Okay. And landing radar cable, VERB 21, NOUN 1 enter, 10, 10 enter, 77 enter. The landing radar is there. Al, you can reduce your throttle to minimum.
SHEPARD Okay. It's coming down.
MITCHELL You have command and thrust.
MITCHELL Okay, Houston. The procedure is complete.
CAPCOM Roger, Ed.
SHEPARD And we're standing by for NOUN 69, as appropriate.
CAPCOM And Antares, NOUN 69 is plus 02800.

END OF TAPE

SC 02 - no 10 plus 028 00.
SC Okay, Houston, how does that look?
CAPCOM (garble)
SC Okay, again.
SC Okay, give me a 10 minute 30 second hack, Al.
SC By mark.
SC 230, okay, we're a little fast. About 10 feet per second. A little slow on H not we're a little low. (garble) now we're in 2 foot per second, it looks good, it looks good.
SC Okay, we're almost back on the track.
SC Yep. Want to give it a 3 minute mark, again.
CAPCOM And, Antares, you're go at 3.
SC Mark 3. Okay, beat the aalue of -
SC Okay, understand, go at 3.
SC H not is low, H is a little low. makes a foot per second difference.
SC Okay, a little higher at the moment Okay, you want to get those EV batts out of the way.
SC No, I was going to wait another 10 seconds here. Look at - take a look at EV batts.
SC Okay, throttle converging looks nice.
SC Houston, my EV batt are go, all in the green.
CAPCOM Roger, Ed.
SC Isn't it a smooth ride.
CAPCOM Yeah, it's great. Antares, you're go at 4.
SC Height looks good. Roger.
SC 4. V sub I is good. H not still hold, H is converging, A (garble) for about 2 and a half foot apart. Good. Down to 32 000, we should be getting landing radar in very soon. They're good, they're go. And we'll give an update at 12 000, there's a little difference in them. On radar, set the lock on radar. That's a thousand.
CAPCOM Antares, Houston, you're go at 5.
SC We can't get the radar in.
CAPCOM Roger.
SC 5 30. We're on profile.
CAPCOM Okay, 6 plus 40 at the throttle down there, Antares.
SC Roger, Houston, we still have altitude velocity light.
CAPCOM Roger.
SC I think they know that.
SC What?
SC I think they know that, stand by for six, mark six.
SC It's about H not is low, H is high, now.

SC we're running high on 8. H and 8 are together.

CAPCOM Antares, Houston, we'd like you to cycle the landing radar breaker.

SC Cycle the radar landing breaker.

SC Okay. It's been cycled.

END OF TAPE

ANTARES (garble)
ANTARES (garble) 157 enter. How's it look Houston?
ANTARES Do we accept.
CAPCOM Okay, we'd like to accept the radar.
ANTARES (garble) great. Great.
CAPCOM Okay, and monitor descent fuel 2.
ANTARES Okay, the throttle down was on time, congratulations. And we're on descent fuel 2.
CAPCOM Roger, Al.
CAPCOM And Antares, Houston, your PGNS H dot is a good one.
ANTARES Okay, thank you. (garble) PGNS
ANTARES I believe those three are up.
ANTARES (garble)
CAPCOM Antares, Houston, you're go at 8.
ANTARES Roger. (garble) I'm starting the camera.
ANTARES 10 seconds to go. 4 -
ANTARES Okay, there's PITCH over.
ANTARES 64 and we have PITCH over, Houston.
ANTARES (garble) And there it is.
ANTARES Right on the money, right on the money.
ANTARES Right on the money.
ANTARES (garble)
ANTARES PD 41.
ANTARES (garble)
CAPCOM Houston, you're go for landing.
ANTARES Here we go.
ANTARES Looks real good.
ANTARES Shoot for the moon, Ed.
CAPCOM Roger, Ed.
ANTARES 2048 feet - coming down a little fast, 2050 feet a second a little bit fast but not bad. 1500 little fast not bad over (garble) LPD's 40, Al.
ANTARES Okay.
ANTARES Were at 1000 feet - 27 feet we're on schedule, right on schedule now. We're by Cone crater right out side to our right.
ANTARES Okay, the (garble) spot is (garble) about half way between triplets and doublets. Both on the track.
ANTARES Okay.
ANTARES About 50 meters.
ANTARES Looks good from here. Looks good from here. Okay, you're through 550 feet.
SHEPARD Okay.
MITCHELL 16 feet per second 500 feet 15 feet per second. Looks good. Your fuel is good at 10 percent.
SHEPARD Let's take it over and move it up a little.
MITCHELL Okay, I think so you're at 340 - Okay. I'd give it a few clisks. You're at 200 feet 5 feet per second. That looks good.

ANTARES (garble)

ANTARES 5 percent fuel looks great. Okay you look like you're going right over the middle of triplet. you're 170 feet out 2 feet per second down 8 percent fuel. You're looking good.

ANTARES Okay, (garble)

ANTARES 170 feet and holding. About 1 foot per second down. Speed it up a little bit.

ANTARES (garble) move forward.

ANTARES Okay. 7 percent fuel. You're still at 170 feet -

ANTARES Heading down.

ANTARES Okay you can move on forward. You're just barely crossing North Triplet. Barely crossing North Triplet. 6 percent fuel Okay 150 feet. (garble)

ANTARES Okay.

END OF TAPE

SHEPARD Low level.
MITCHELL Alright.
MITCHELL If you could land over here, there's the dust, Al, 110 feet. Three feet per second down, looking great. (Garbled) 6 percent. There's good dust. You're on your own.
SHEPARD Starting down, starting down.
MITCHELL Okay. (garbled) 90 feet, 4 feet per second, 5 feet per second, down.
SHEPARD Okay.
MITCHELL Going down, looking great.
SHEPARD 60 seconds.
MITCHELL Okay. 50 feet down, 50 feet.
SHEPARD We're in good shape, too.
MITCHELL 3 feet per second, 40 feet, 3 feet per second, 30, 3 feet per second, looking great, 20 feet, 10, 3 feet per second, contact, Al.
SHEPARD (garbled) stop. (garbled) auto, auto.
MITCHELL We're on the surface.
SHEPARD Okay, we've made a good landing.
CAPCOM Roger, Antares.
MITCHELL 413 plus 10 000. That was a beautiful one.
SHEPARD We're completely off (garbled) the slope, but other than that we're in great shape. Right on the landing site.
MITCHELL Okay. Recycling the parker valve. Gauge, closed, open, closed, open, open, open, open, open, op --
SHEPARD Couldn't give me a REG 1 closed, so start back Bravo 4000 zero (garbled) on, descent vent fired.
MITCHELL Okay. (garbled)
SHEPARD Burn is off.
MITCHELL Okay. (garbled) fuel.
SHEPARD And, they're coming down.
MITCHELL They're coming down. Okay.
SHEPARD Okay.
MITCHELL The propellant temp transferred to --
SHEPARD Bit rate is norm.
MITCHELL Ascent then descent.
SHEPARD (garbled) ascent still good, descent to 1 and 2 coming out on both.
MITCHELL Okay. Now, if you'll give me a monitor cycle.
CAPCOM Antares, Houston. You're stay for T1.
SHEPARD Okay. Stay for T1. Ascent helium 2 looks good, ascent helium 1 looks good.
MITCHELL Okay. Okay. Lithium quantity monitor, I'll take a look at those.
SHEPARD Take a look at those babies.

MITCHELL Okay. Just like they did in orbit. Ascent 2 is full, after descent. Alright. Then add the sequence carefully to the OPS.

MITCHELL Okay. VHF A transmitter to voice. Good for stay for T1. (garbled)

SHEPARD Plus 20 000.

MITCHELL Plus 20 000. And, 400 plus 4.

SHEPARD 400 plus 40 000.

MITCHELL 414. That's descent rate.

MITCHELL Houston, did I get a 414 plus 20 000 in?

CAPCOM Stand by.

CAPCOM That's affirm, Ed. You got it in.

SHEPARD Okay. .01.

MITCHELL Good.

SHEPARD (garbled) you're down 43, Houston.

SHEPARD You know we are a little sloped aren't we?

MITCHELL Yep.

SHEPARD That's the flattest place around here, though.

MITCHELL Al, what's that about 8 degrees of roll we're in or 8 degrees slope.

CAPCOM Okay. We got the Noun 43 on.

MITCHELL Okay. Let me copy those down. Book 2. Back on our book.

SHEPARD Stop and reset.

MITCHELL Noun 43.

SHEPARD Hold it.

MITCHELL I did it before I got it down.

SHEPARD P67.

MITCHELL Pardon.

SHEPARD I had 367 minus 1751.

END OF TAPE

SHEPARD 367 ...
MITCHELL Pardon?
SHEPARD Minus 367 minus 1751.
MITCHELL Minus 367, what?
SHEPARD 1751.
MITCHELL What was the altitude readout? Get that.
SHEPARD Want to give me the - everything from P12, please.
MITCHELL Okay. P2 109.
SHEPARD Plus 109.
MITCHELL 04 ...
SHEPARD Plus 04 ...
MITCHELL Plus 3406.
SHEPARD 3406. I have 109 04 3406.
MITCHELL That's good.
SHEPARD How about my noun 36?
MITCHELL Okay, looks good, (garble) have at it. 55124.
SHEPARD Okay, VERB 25, enter plus 5512 plus 15 enter, o enter.
MITCHELL Okay.
SHEPARD Okay.
MITCHELL Wait a minute, now, Houston, how do you like the AGS alinement, should we go ahead and update the state vector or stay with what we have?
CAPCOM Stand by. Okay, Ed, the AGS is go as is.
MITCHELL Okay, go as is. 411 plus 10 pounds, 410 plus 0.
SHEPARD Okay, we're waiting on update.
MITCHELL Okay, descent helium ...
CAPCOM Antares, Houston, you are safe for T-2.
MITCHELL Roger, roger.
SHEPARD Okay, ready for T-2. Tape recorder off, ICS PTT.
MITCHELL Say, Chet, that was really great work you did on that abort problem.
CAPCOM Yeah, those guys did a lot of scratching around there, Ed.
MITCHELL Yes Sir, we sure appreciate that.
CAPCOM You'd better really save the mission.
CAPCOM Antares, Houston.
ANTARES Go ahead.
CAPCOM Your nouns are sitting still there, we'd like to try to get the steerable gone. Pitch plus 124 yaw minus 42 and stay in flow.
ANTARES 124 minus 42 and stay in flew.

ANTARES Okay, Fredo, you got it, I've picked up the signal strength a little.

CAPCOM Antares, Houston, say again.

ANTARES You have the steerable, Fredo. Have locked up Flew.

CAPCOM Okay, Antares, that looks good.

PAO This is Apollo Control. Some of the numbers associated with the landing. The ignition time for power descent initiation was 108:42:29 ground elapsed time. Actual touchdown was at 108:55:14, a total time in power descent of 12 minutes 46 seconds. At the present time the command service module, Kitty Hawk, is on air-to-ground 2 which will be recorded in the news room and transcribed, however, the air-to-ground 1 for lunar module, Antares on the lunar surface, is prime and will be carried live as the conversations continue. When you have loss of signal with the command module in 16 minutes. We're up live with Shepard and Mitchell in Antares at the Fra Mauro landing site.

ANTARES Houston, my values were 047 053, 047 plus 37774 053 plus 00541.

CAPCOM Okay, we copied, Ed.

END OF TAPE

CAPCOM Antares, Houston.

ANTARES Go ahead, Fred.

CAPCOM Okay. Because your attitude sitting there, Al, the first star there, Arcturus, is going to come up in detent 2 rather than detent 3

ANTARES Okay. Very good.

ANTARES Okay, Houston. Do you have NOUN 83.

CAPCOM Go ahead, Antares.

ANTARES Do you have our NOUN 93.

CAPCOM Roger, Al. We got them.

ANTARES Okay, Houston. We're going to have to crank up the rendezvous radar and get it down out of the way. It apparently drifted up during descent.

CAPCOM Roger, Antares.

PAO This is Apollo Control, 109 hours 24 minutes ground elapsed time. We have had loss of signal with the command module Kitty Hawk. As it passed behind the moon on the - toward the end of the 14 lunar revolution. We're still up live for any further conversation between Shepard and Mitchell aboard Antares at the Fra Mauro landing site. At the present time, they're busy with going through their lunar surface checklist, doing some navigation alinements with the optical alinement telescope which is roughly analogous to the sextant on the command module. Then at 110 hours 20 minutes they're scheduled to have a meal. Some 2 hours from now roughly, they should begin preparations for the first extravehicular activity. To recapitulate again, the landing phase earlier in the revolution prior to the one in which the power descent and landing was made, some spurious numbers came up in the lunar module computer programs which were indications of an abort signal. These were reckoned to be contamination in the abort switch itself.

CAPCOM Okay. We need to change the seconds - your second technique 257. That's on page 1-5.

ANTARES Okay.

CAPCOM Okay. It should be star - rather than Decrion. It should be star 56 which is Beta Centari and the new NOUN 88 are X minus .21408, Y minus .12572, Z minus .3 - correction - minus .43401.

ANTARES Okay. I copy the second star page 1-5 is Beta Centari instead of Decriox. It's number 56. And I presume it will be detent 1. And vector NOUN 88 are minus .21408, minus .12572, minus .43401.

CAPCOM Okay. That's correct, Ed.

PAO This is Apollo Control to continue the recapitulation of the problem with the lunar module computer. The suspected cause was contamination in the abort switch. By tapping on the switch the numbers would disappear both in the onboard display keyboard readouts and

PAO the telemetered numbers here on the ground.

ANTARES Okay, Fredo. That was a real fine jump. Thank you, buddy.

CAPCOM Thank you, Al.

PAO Apollo Control again. To bypass this potential problem which would cause an abort during the power descent and computer routine was devised by the manufacturers or the designers, I should say, of the Apollo guidance system whereby the abort signal would be bypassed. This routine was entered into the DSKY after ignition for power descent and apparently caused no problems with the fairly nominal descent profile and touchdown right on target. Power descent ignition again 108:42:29, touchdown at 108:55:14 for a total time in the power descent of 12 minutes 46 seconds. Continuing to monitor the air-ground circuit with Antares on the lunar surface at 109 hours 30 minutes ground elapsed time, this is Apollo Control.

PAO This is Apollo Control at 109 hours 35 minutes ground elapsed time. We're estimating a Change of Shift Briefing with the offgoing flight director Gerry Griffin and hopefully, spacecraft communicator Fred Haise, over in the small briefing room in the Apollo News Center Houston in about 15 or 20 minutes. Still up live for any conversations with lunar module Antares, this is Apollo Control at 109:36.

CAPCOM Antares, Houston.

ANTARES Go ahead.

CAPCOM Okay. You can go on by those alarms Al. I think they're due to hit mark reject before your doing the VERB 32 enter. That isn't necessary. You can just reload right over them.

ANTARES Okay. We need to get rid of this mark, Fredo. We're going to reject it and start over.

CAPCOM Okay.

ANTARES Okay, Houston. Shall we torque those.

CAPCOM Stand by, Ed.

CAPCOM Okay. They look good, Antares. You can torque them now.

ANTARES Al says he can't do any better.

CAPCOM You're right.

ANTARES Okay, Houston, what would you like to do with those numbers?

CAPCOM Stand by.

CAPCOM Antares, Houston. Recommend accept.

ANTARES Okay. We're going to accept.

PAO Apollo Control, Houston. At 109 hours 53 minutes ground elapsed time. We've had a handover of flight control teams in Mission Control. Flight director

APOLLO 14 MISSION COMMENTARY, 2/5/71, 3:34 CST, 109:12 GET, 316/3

PAO Pete Frank presently pulling as flight control team for a GO-NO/GO for powerdown. We'll stand by and continue to monitor. We're at 109 hours 54 minutes ground elapsed time and this is Apollo Control, Houston.

END OF TAPE

ANTARES Houston, Antares.
CAPCOM Antares, this is Houston, go ahead.
ANTARES Hello, Bruce. Al said that Beta Centaure which you wanted for this second star is in detent 6. Do you want it in 1 or 6 now that you've changed it.
CAPCOM Scorpio, Houston. detent 6 please.
ANTARES Okay.
PAO This is Apollo Control, Houston at 110 hours 1 minute ground elapsed time. The change of shift to news conference is ready to begin in the large auditorium of Building 1, and at this time we will take down the live air to ground and switch to the news conference. This is Apollo Control Houston.

END OF TAPE

PAO This is Apollo Control Houston at 110 hours 51 minutes ground elapsed time. Since we took the line down we've had considerable conversation with the crew aboard Antares with Al shepard and Ed Mitchell. And we will play that back for you now.

ANTARES Houston, you're desire is on the noun 89.

CAPCOM Stand by.

CAPCOM Antares, this is Houston, we recommend that you do not accept this noun 89, the first set of marks was satisfactory, over.

ANTARES Okay.

ANTARES Al (garble) the line is a lot better today.

CAPCOM Jolly good, can you see at the center of the AOT in this case?

ANTARES Yeah, as a matter of fact, no blind spots.

CAPCOM Beautiful.

ANTARES This is Antares, we're standing by for a stay.

CAPCOM Antares, this is Houston. Stay, over.

CAPCOM Antares, this is Houston. Stay, acknowledge, over.

ANTARES Okay, we're having a little chuckle about that, Chris, but we acknowledge very happily.

ANTARES And we will stay.

CAPCOM Roger, out.

ANTARES Houston, would you like my updated 047 053 numbers?

CAPCOM That's affirmative.

ANTARES Roger, 047 plus 37773, 053 is plus 00616 and we're standing by for P22 (garble)

CAPCOM Okay, I copy address 47 37773 and 53 is 00616.

ANTARES Good readback.

ANTARES Houston, same Antares this is POO updata.

CAPCOM Houston, roger, out.

CAPCOM This is Houston, it'll be a few minutes yet before we're ready to uplink the OLS and CSM state vectors to you. We'll let you know when we're ready to come up with it.

ANTARES Okay, we're pressing on with our power down check list.

CAPCOM Antares, this is Houston, we're ready with the uplink on LOS and CSM state vectors using still POO updata.

ANTARES That's affirmative.

CAPCOM Roger.

CAPCOM Antares, this is Houston. Preliminary P22 acquisition time is for 110 plus 50 plus 00, we'll give you the more precise estimate as we approach it, over.

ANTARES Roger, readback 110 plus 50 plus 00 is the preliminary.

CAPCOM Roger, out.

CAPCOM Antares, this is Houston, the uplink is complete, computer's is yours.

ANTARES Okay, thank you.

CAPCOM Antares, this is Houston, we're standing by for your description of the lunar surface as viewed from the windows of the LM and we'd also be interested specifically in hearing whether you feel that the roll in the spacecraft is due primarily to terrain or whether you feel that there is some landing gear stroking, also, over.

ANTARES Okay, we will be right with you on the the condition of the lunar surface here momentarily we're considering one of the cameras at the moment. With respect to the upward roll, it looks as though it's probably due mostly to the terrain, it doesn't really have a good level spot to land down around here unless we proceeded quite a bit closer to doublet. So we'll keep you (garbled) and advise you on that after we've had EVA.

CAPCOM Okay, very good. Sounds like you may have a nice level flight over doublet for the ALSEP then doesn't it?

ANTARES Well, we'll find one. Okay, Houston, this is Antares here, you ready for some words on the surface?

CAPCOM That's affirmative Antares. Go ahead with your description.

ANTARES Okay, you may have heard after P64 pitch over the gulf craters in the landing site were really visible. The sun angle was good, we were able to recognize it, even easier than we were on the LMA display at the Cape. The LPD input zero measured one left and we took over short of triplet and I thought at first I was going to land just south of the (garbled). It's rougher over there than the LMA shows. We came back on track and landed. (garbled) doublet and I made track just 100 meters short of our target. Okay, with respect to the general terrain. We are in a depression here, we're looking of course directly toward doublet crater which appears to be above us in elevation by approximately 25 to 30 feet. The terrain gradually upward in that direction, there is (garbled) modulation but generally speaking it's a gradually upward to the area of doublet. The deactivated spacecraft is about one and a half degrees to the right of the landing

ANTARES plane and of course that puts the shadow of the LM off the left, because of the current front location. Can you read me alright?

CAPCOM That's affirmative Antares, we copying you full, Over.

ANTARES Okay, well that is completing the pictures out of this window. I'll continue to say that generally speaking as I sweep from one horizon to the other, we find that the terrain is a little rougher than I suspected and we are in a depression here in the landing site with respect to the south and to the north. The depression at the north appears to be very close to us about 50 or 60 meters away, to the south the land gradually slopes up to a range which is perhaps half a mile away. The general area in the left hand window of the LM is relatively free of large boulders, I see less than ten within my field of view that are - over the size of perhaps 8 to 10 inches. And now Ed's ready to take over, (garbled). Over to Ed.

CAPCOM Roger Ed, go ahead.

ANTARES Okay Houston. I'm just trying to get orientated, I think I can see quite a few of the craters that are out my win -

END OF TAPE

ANTARES - at this time to get oriented, I think I can see quite a few of the craters that are out my window are here on the map. There's several large enough to be seen on the map, and in addition there's some reasonably large boulders. I will try to get them located first, then I'll describe what I see.

CAPCOM Okay.

ANTARES Okay.

ANTARES It doesn't look like it's going to be quite as easy as I thought, Houston, to figure out these craters that I see in front of me. At this point on the map until we get a little bit better clear view from the outside. Let me just pick it up with a description. First of all, as Al pointed out we're very close to the landing site that was proposed -

CAPCOM Antares, Houston.

ANTARES - a bit more toward Triplet than that. Go ahead.

CAPCOM Roger. Updated P22 acquisition time 1 10, plus 51 plus 00 and that will coincide with the angles that you get onboard. You should expect to see the CSM about 30 seconds later. Over.

ANTARES Roger. 110 51 50.

CAPCOM 110 51 00.

ANTARES Okay, 00, thank you.

CAPCOM Roger. And continue.

ANTARES Okay, Houston. As Al pointed out the torque Dublet didn't arise, and then the ridge that we have talked about that is beyond Dublet is very pronounced. It forms our skyline or horizon. And we seem to be sitting in a bowl. It slopes toward us from the west, it's rather choppy I've got to admit, undulating. But, the ridge of beyond Dublet is the highest thing I can see in front of me. Looking around to the right, the skyline is quite undulating. There is a large old depression to our right or that is to the north of us, which forms another bowl very similar to the one that we appear to be sitting in. And, I can see several ridges and rolling hills of perhaps 35 to 40 feet in height. Obviously very very old craters that are almost lost, almost indistinct now between myself and the skyline to the north horizon to the north. It just looks like a series of low hills from this vantage point.

ANTARES Okay. And, the window photography is completed. Magazine QO, QO, exposure 20.

CAPCOM Houston, roger. Out.

ANTARES Okay, Houston. The undulations are far too complex for me to try to describe them right now without getting in a better advantage point so I can point them out on your map. I'm sure I can do that as soon as I get a better handle on our location. It may be surprising to say

ANTARES that I think there is more terrain, more relief here than we anticipated from looking at the map.

ANTARES There's a hell of a lot of relief inside the cabin, I'll say that.

ANTARES Okay. There's a few boulders out my window. They're scattered around falling between here and Doublet. I see at about my 230 position probably 50 yards out a large boulder that's probably 3 feet across. There it's the largest one I have in my field of view or at least my near field of view. And, there are 2 or 3 or others perhaps half that size or appear to be half that size in that same vicinity just a little beyond, about 230 on the plot code and perhaps 50 meters to the largest one then another 10 or 15 to the other boulders. They don't seem to form a pattern that I can see. The color that we're looking at is kind of a mouse brown or mouse gray. And, obviously it changes with the Sun angle. The surface ... there are numerous craters in my field of view. Some, old, very subdued, some overlapped by newer craters. Some that seem to be relatively recent. Most of the surface, however, seems to be fine grain. Incidently, I do see some linear features on the surface. Very small fine linear features. I do not think that they are errosion patterns, they may be. However, I can see a suggestion of them quite a ways away from the LM. Kind of running parallel to those that I can't see, and we'll have to talk about later when we get that GARBLE.

ANTARES Go ahead, Houston.

ANTARES I think we see lineations that are not Go ahead.

CAPCOM Roger. Could you give us a little more description on the near field craters that are the ones that are right in close to the LM?

ANTARES Okay. We have a small pattern of craters at the 12 o'clock position, maybe about 12:30. I have an old subdued crater with a pressure crater in the middle of it and two or three grouped around on the north edge of it. That crater is about 15 feet across. Immediately in front of us, maybe 15 feet is about the 6 or 7 foot crater. That's pocked with a few pressure craters on it. At the 1:00 o'clock position I have an old crater probably 12 foot in diameter with a fairly small, relatively fresh crater on the south-side of it that's maybe a foot in diameter, and as a matter of fact, the larger of those two I just described seem to form the south pair. The south of a very small triplet. As a matter of fact, the one I described, the first one I described is in line with those three, as a matter of fact, they form a quadruplet I guess. Now those are the largest craters in my near field and they are the quadruplet I spoke of. The first one I described is in about the o ANTARES 12:30 position. It's probably fifty out At the fourth one which is the most northeasterly it is about the 2:30 position and probably 40 feet out. Any questions.

CAPCOM All right. It sounds very good Ed.

ANTARES Okay. Beyond those is the 1 to 1:30 position. I see two craters that the surface is moving up from me at that point. Two craters that are probably - the closest one is 25 feet across. It's about 60 to 80 feet from us and I did the 2:30 position. And about 25 feet beyond that one is a crater which is 15 to 20 feet across. These are both smooth rimmed craters. They are rim craters but they've been beaten down and have smaller craters on the sides. Those two that I just described are south of and there are some large block - rock blocks that I spoke of. They're south by about 30 to 40 feet. Let me describe two more craters and then you can have it, I'm getting dry. Almost due north which is my 3:00 o'clock position - let's say the 2:45 position - I don't want to be discriminating here - 2:45 position at about 85 to 100 feet. Almost in line with the quadruplet is another crater 25 to 30 feet across with a small one on it southwestrium. Getting closer at the 3:00 o'clock position just barely in my right hand window field of view is about 35 to 40 feet out - yeah, make it 40 feet out, is a crater about 12 feet across which seems relatively fresh. However, all these craters have small, very small craters alining them.

ANTARES Okay. I'll take over. Okay, Houston referring to the surface map on the forward course Charlie meter in -

END OF TAPE

ANTARES ... on the following coordinates Charlie Peter and 64.9 is a crater, a very new crater. Which I'm looking at almost directly a beam of the LM. So I would say that our landing site is just about on track and we're perhaps - perhaps 10 meters or 20 meters short of the landing site. The bright crater on the left wall of (garble) Doublet also is very visible to us from this point as it is in the landing surface photographs.

CAPCOM Antares, Houston. I understand you have this Charlie Peter 64.9 crater at your 9 o'clock position. Is that correct?

ANTARES That's right.

ANTARES Houston, we're going to have to get on with our P22 here very quickly.

CAPCOM Roger, go ahead.

ANTARES Yeh, you could call it the 9:30 position, Houston.

CAPCOM Roger. We got you.

CAPCOM Antares, Houston. I have your consumables update when you're free.

ANTARES Roger, standby one.

ANTARES Okay, signal six is building up. Looks like we're going for a lock-on.

CAPCOM Roger, Ed.

ANTARES And the no track light is out. Okay, we'll lock.

CAPCOM Antares, this is Houston. I have the LM weight update for your DAP load and we do want to do a E memory dump prior to the gravity measurement.

ANTARES Okay. Okay, I'm ready for the updated weight.

CAPCOM Antares, this is Houston. LM weight 10869. Read back. Over.

ANTARES Roger. 10869.

CAPCOM Roger, Ed. When you're ready to copy Antares, I have your consumables update and also the updated liftoff times for revs 16 through 19. Over.

ANTARES Okay, Houston, I'm ready to copy liftoff time.

CAPCOM Roger, Ed. Updated liftoff times for rev 16 112 plus 52 plus 47 rev 17 114 plus 51 plus 07 rev 18 116 plus 49 plus 28 118 plus 47 plus 48. Read back. Over.

ANTARES Okay rev 16 112 52 47 rev 17 114 51 07 rev 18 116 49 28 19 118 47 48.

CAPCOM Antares, Houston, readback correct. I have your consumables up date when you're ready over.

ANTARES Okay, ready to copy.

CAPCOM LM consumables update at a g.e.t. of 110 plus 30 RCS ALPHA 80.0 BRAVO 77.0 descent oxygen

CAPCOM 81.6 ascent oxygen NA and 97. Descent water 75.1 ascent water 98.4 98.8. Ampere hours descent 1199 ascent 572. Over.

ANTARES Rog. Give me the descent water again please.

CAPCOM Descent water 75.1 percent. Over.

ANTARES Okay. g.e.t. of 110 30 RCS A is 80.0 B 77.0. Descent 02 81.6 assent 02, NA and 97. Decent water 75.1 ascent water 98.4 98.8. Ampere hours, 1199 and 572.

CAPCOM Antares, this is Houston. Read back is correct. Out.

ANTARES Houston, do you have any questions about the surface comments we've made so far?

CAPCOM Stand by please. Antares, Al, this is Houston. The only additional questions that we have generated from your discription is a request for details on the lineaments specificaly we are interrested in knowing the direction that they trend, the abundance, and the size, over.

ANTARES Okay, stand by one.

ANTARES Houston, I'll pick that up for a moment. I'm not going to describe the radiation series and because the one series may very well be confused with a descent engine pattern, but I will say that further out to the north I can see lineations that appear to run roughly east-west, but lets say a little bit north of west, south of east, along that line. And its very fine grain, almost imperceptable. Except it does have a little bit of shadow effect, almost like sandunning but not quite. And I can't really see much more about it until we get out and look at it. They may disappear when we get out there, but their are certainly visible from this view point.

CAPCOM Roger Ed. and standing by for your E memory dump.

ANTARES We're coming now.

CAPCOM Antares, this is Houston.

ANTARES Okay go ahead.

CAPCOM Antares, this is Houston. Based on your discription, we estimate here location to be Charlie Papa decimal 9, and the 65.3. I say again. Charlie Papa decimal 9, 65.3. Over.

ANTARES Houston, we are not making an issue of it at the moment. I think the crater at Charlie Romeo point 2 and 64.5 is right out in front of me. About a 150 feet. If that is so and I believe it is, it places out position just a little bit north of were you said we were.

CAPCOM Okay we copy.

CAPCOM Understand that you would call that crater at you 12 o'clock position?

ANTARES It's really about 12:30, and probably 130 to 150 feet out.

CAPCOM Roger out.

ANTARES Maybe a bit more. Let's say over a 150.

CAPCOM Antares, this is Houston, standing by to commence the gravity measurement on your go.

ANTARES Okay, Houston, the computer's yours.

CAPCOM Roger out.

ANTARES Okay, Houston, the crew status report. We've taken no medication, we're both in excellent shape. PRD for the commander is 16049, for the LSV is 07047.

CAPCOM Roger 16049, 07047 and are you all getting something to eat up there now?

ANTARES As soon as we stop asking questions, we'll start eating.

CAPCOM Okay, munch away.

ANTARES Okay, we'll give you a little verbage between bites here.

CAPCOM No talking with you mouth full.

ANTARES Did you say talking or torquing?

END OF TAPE

ANTARES Okay. We'll give you a little verbage between bites here.

CAPCOM No talking with your mouth full.

ANTARES Did you say talking or torquing.

CAPCOM Antares, this is Houston. Based on Ed's report on the crater charlie Romeo 2 and 645, our new estimate of your position is charlie kayback decimal 5, 65.4. Over.

ANTARES Okay. CQ 5, 65.4.

CAPCOM Roger.

PAO This is Apollo Control Houston at 111 hours 21 minutes ground elapsed time. You heard that long exchange between capsule communicator Bruce McCandless here in Mission Control and the crew of Antares speaking from the Fra Mauro region. Al Shepard, Ed Mitchell. Earlier flight dynamics had given a preliminary set of coordinates of 3.65 South, 17.46 West. At any case, quite close and the computer on Antares is probably smarter than maps prepared here on Earth. From that description, Antares appears to be within several feet of the prescribed landing point. As we look over copies of the onboard grid maps of the area. Coordinate numbers, by the way, will be further refined with the rendezvous radar tracking. That's program - computer program 22 on board the LM. You heard the description of that as Kitty Hawk passes overhead. Al Shepard, Ed Mitchell obviously well-schooled in their procedures starting first with a general description of geological features and then proceeding with increasing detail. We're at 111 hours 23 minutes ground elapsed time and standing by continuing to monitor, this is Apollo Control, Houston.

ANTARES Houston, Antares. Just an interesting comment while I think about it. We expect a zero phase. I was aware of it but it really gave me no problem at all during the descent from high gain on down. Of course, we are out of plane here as far as the azimuth of the sun. The rest is out of plane as far as we're concerned. But nonetheless, I did notice zero phase, because I looked for it. But with respect to interfering with the landing, it was not a problem.

CAPCOM Roger. We copy that. And we got a question for you. How soon did you recognize Triplet.

ANTARES Almost as soon as I picked up Cone. Almost immediately.

CAPCOM Roger. Out.

ANTARES I probably looked out right after Al did and saw the whole pattern, the whole pattern was immediately recognizable to me.

CAPCOM Roger. Out.

ANTARES Carrying on with an earlier comment, that we've - as the left side is concerned, Houston. I'm surprised by the lack of large rocks in the area in front of us. There just don't appear to be more than half a dozen within the field of view in this southwest quadrant. On the crater which I mentioned in our 9:30 position earlier, it has no name, but the one which we coordinated for you, now there is a definite rate pattern visible coming from that crater. A rate pattern of fallen rocks with (garble). They are (garble) inches in size at the rim varying on up to about hand-size pebbles at the edge of the rays. There appear to be rocks inside the rim of the crater, but they're all rock mixed images and I wouldn't - not what I would classify to be a rocky Crater.

CAPCOM Roger, Al. Sounds like you should have no problem in getting your football-sized rock.

ANTARES Bill, they are not as plentiful as we might expect. We will be able to get at least one on each EVA.

CAPCOM Roger.

PAO 111 hours and 28 minutes into the - ground elapsed time for Apollo 14. That was Al Shepard and Bruce McCanliss talking about one of the EVA tasks, that of acquiring football-sized rocks. We're at 111 hours 29 minutes ground elapsed time and continuing to monitor, this is Apollo Control, Houston.

PAO This is Apollo Control, Houston at a ground elapsed time of 111 hours 32 minutes into the flight of Apollo 14. Although most of our attention has been directed toward Antares, there is another flight control team in the mission control that's headed by Flight Director, Glynn Lunney with Ron Evans serving as capsule communicator in contact with Stu Roosa aboard Kitty Hawk. Presently Kitty Hawk is passing behind the moon on its - on the 15th revolution. We will reacquire the command module at - in some 34 minutes, we're at 111 hours 33 minutes ground elapsed time, this is Apollo Control, Houston.

CAPCOM Antares, this is Houston. Could you give us some feel for your position relative to starting cabin prep for EVA-1 on the timeline. Over.

ANTARES Well, we're about 8 bites away.

CAPCOM Roger, munch away.

Antares We should be through with our lunch here, or whatever meal it is, in about 10 minutes and the perfect time for the EVA-1 prep.

CAPCOM This is Houston. Roger. Out.

PAO Apollo Control Houston. That was Al Shepard advising Mission Control that he and Ed Mitchell finishing their meal at this point and will be picking up

PAO within perhaps 10 minutes their preparation for EVA-1. 111 hours 35 minutes ground elapsed time, this is Apollo Control, Houston.

END OF TAPE

CAPCOM Antares, this is Houston. We've finished the gravity measurement test. Your computer.

SHEPARD (garbled)

CAPCOM Roger. Out.

CAPCOM Antares, this is Houston. At your convenience, we'd like you to go into program 06 firing down - or putting the computer in standby and the IMU operate circuit breaker to OPEN. Over.

SHEPARD Okay, Bruce, we'll be doing that momentarily.

CAPCOM Roger. No rush.

SHEPARD Houston, we're in Antares, now starting EVA-1 prep.

CAPCOM Roger. We're setting our timer to 15 minutes counting up starting now.

PAO Apollo Control -

SHEPARD (Garble)

PAO Apollo Control, Houston. 111 hours 49 minutes in ground elapsed time. That - that was Al Shepard aboard Antares advising the ground that they have started their EVA preparations. Standing by, continuing to monitor, this is Apollo Control, Houston.

CAPCOM Antares, this is Houston. If you feel like giving us a running commentary as you go through the equipment prep for EVA-1, we'll be checking you off here.

ANTARES Okay, we'll try to do that.

ANTARES Houston, we've completed the first paragraph.

CAPCOM Houston. Roger. Out.

SHEPARD Okay, one quick check. Oh, hell, the (garble) is fouling up. It will be all right.

PAO Apollo Control, Houston. 111 hours and 54 -

SHEPARD (garbled) Houston. The LMP's flipped against the forward hatch.

CAPCOM Houston, Roger. Out.

PAO 111 hours 55 minutes. Antares' crewmembers, Al Shepard, Ed Mitchell proceeding with their EVA checklist.

CAPCOM Antares, this is Houston. Would you describe your interior lighting configuration to us so that we may use it for Apollo budgeting for later missions. Over.

MITCHELL Okay Houston. The only lights we have left on now are the annunciator numerics and the caution and warning. But we have turned off the floodlight and there's adequate lighting.

CAPCOM Roger. Thank you, Antares.

PAO That was Ed Mitchell responding to that question from the ground. Apollo Control, Houston at 111 hours and 57 minutes ground elapsed time.

SHEPARD Houston, this is Al. We have one problem here in paragraph 3, the first line on my side the UCTA has some glue in it and it doesn't seem to work. Ed is able to depress the valve on the suit side and get some flow, but we've tried two different collection bags and we are unable to get flow. We're going to press on in that configuration and you might think about that for awhile.

CAPCOM Okay. Understand it's your UCTA that has the problem?

SHEPARD That's right.

CAPCOM Roger.

PAO Apollo Control, Houston at 112 hours 01 minute into the flight. The acronymn UCTA standing for urine collection transfer assembly. The crew aboard Antares proceeding with their EVA preparations. We'll stand by and continue to monitor. At 112 hours 02 minutes ground elapsed time, this is Apollo Control, Houston.

CAPCOM Antares - Al, this is Houston. Are you able to check the hose from the UCTA to the fitting in the suit insure that hose is not kinked. We have had problems in this connection in the past and do you feel that the reserve capacity in the UCTA would be sufficient for this EVA or not? Over.

MITCHELL We've just been discussing that. I think that the latter is probably the case.

SHEPARD We'll make one quick check on that hose.

CAPCOM Antares, Houston. What was the resolution on the UCTA situation?

MITCHEL (garbled) Rog. Houston, we've got it fixed and we'll have it - be back on the timeline here very shortly, I think.

CAPCOM Roger. Out.

MITCHELL We had a kink in the hose and we've got that straightened out and drained.

CAPCOM Beautiful.

MITCHELL Okay, Houston, we're down to verify watch on PTA proceeding on.

CAPCOM Houston. Roger. Out.

PAO Apollo Control, Houston at 112 hours 15 minutes ground elapsed time. The crew of Antares are proceeding with their EVA checklist. Our surgeon in Mission Control advises that during the powered descent phase leading up to the landing of Antares, he was monitoring spacecraft commander, Al Shepard and described his heart rate as extremely cool in the upper 80's during most of the period from PDI to touchdown; peaked at one point at 113. We're at 112 hours 16 minutes ground elapsed time and this is Apollo Control, Houston.

MITCHELL Okay, (garbled) Charlie, Charlie is installed on the surface to put your camera on.

CAPCOM Roger, we copy a clam on California

CAPCOM installed on the sequence camera.

MITCHELL That's affirmed. Our cable connected and it's verified operational.

CAPCOM Roger. Out.

SHEPARD Okay. The CDR is going to deploy the EVA antenna.

CAPCOM Roger, CDR.

CAPCOM Antares - Al, Houston. You confirm the EVA antenna is deployed now?

SHEPARD That's affirmative and we're proceeding on.

CAPCOM Roger. Out.

MITCHELL Alright, Houston, we have the RCU's on the baseball.

CAPCOM Houston Roger. Out.

MITCHELL CDR booster on.

CAPCOM Roger, Ed.

END OF TAPE

ANTARES Okay, the LMP's OPS is on the floor.
CAPCOM Say again.
CAPCOM Say again, Al.
ANTARES The LMP OPS is on the floor.
CAP2OM All right, Roger.
PAO Apollo Control, Houston, 112 hours, 30 minutes ground elapsed time. That last report from Al Shepard saying that the oxygen purge system for the lunar module pilot is on the floor per the flight plan. It appears that we're about 10 minutes behind the flight plan schedule at this point. The crew taking a bit longer in completing their morning meal. We're at 112 hours, 31 minutes this is Apollo Control, Houston.
ANTARES Okay, we've had two satisfactory OPS checkouts - the CDR is reading 6 000 plus and the LMP is reading 5 900 short.
CAPCOM Antares, Houston. Roger, out.
ANTARES Antares is proceeding with the antifog on the inside of the helmet.
CAPCOM Roger, Antares.
PAO This is Apollo Control, Houston at 112 hours, 40 minutes ground elapsed time. Al Shepard, Ed Mitchell continuing with their preparations for their first lunar excursion. The landing position indicates that the porch of Antares is facing slightly to the north of west - almost as precisely as planned. We're at 112 hours, 40 minutes. This is Apollo Control, Houston.
CAPCOM Antares, Houston. How are you progressing?
ANTARES Okay. We're down to the point where the arm rest is coming up. We have one more to go.
CAFCOM Roger, out.
ANTARES Ed, we're in programmed zero 6 and the forward hatch handle is unlocked.
CAPCOM Roger, out.
ANTARES Okay, Houston. We're at that point where we can reel PLSS out - get the light weight one.
CAPCOM All right, roger. I'll have Ron come on up the ladder.
ANTARES Great.
PAO Apollo Control, Houston. 112 hours, 48 minutes ground elapsed time. The Ron referred to in that consversation with Ed Mitchell is Ron Blevens who has led the crew through these procedures while in training. Ron Blevens presently in the staff support room in Mission Control - the flight director's staff support room. That last report from Antares indicates the crew is preparing to don the PLSS. PLSS being an acronym for the portable life support system that the crewmen wear on their backs. We're at 112 hours, 49 minutes ground elapsed time and this is Apollo Control, Houston.

C ANTARES Okay, the LMP presses on and we're proceeding with the PDI split.

CAPCOM Roger, Al.

ANTARES Okay, the Commander's PLSS is on. We're going for the RCU.

CAPCOM Roger, Al.

ANTARES Okay, Houston we've verified power down circuit breaker configurations and we're proceeding with the COMM check on the PLSSes.

CAPCOM Roger, Al.

ANTARES Houston, Antares. How do you read?

CAPCOM Ed, this is Houston. I read you loud and clear. Over.

ANTARES Okay, Bruce. Read you loud and clear.

ANTARES Okay. You all done now through there? Ed.

ANTARES Okay the COMM band was GARBLE. Picked it up there to voice on OFF. ON OFF ON. POINTS on OFF ON OFF HIGH. Okay. Range RANGE. GARBLE Put her on.

CAPCOM Okay.

ANTARES GARBLE in a EVA. GARBLE. Squelch to enable. Okay, you connected GARBLE at this foot COMM. Okay connect to the foot COMM.

ANTARES Okay here we - we're at peak A. Think we can do it?

ANTARES A.

ANTARES We'll turn the clock for you.

CAPCOM Two.

ANTARES Counterclockwise there's the tone.

ANTARES In flight B, in flight O. Momentary.

ANTARES Okay, O still ON.

ANTARES Readout the 02 pressure gages.

CAPCOM Okay, greater than - looks like about 96 per cent.

ANTARES 96 percent. Okay, Houston.

CAPCOM Wait a minute. It's 55.180 GARBLE about 92 percent. Okay.

ANTARES 92 percent. LM radio loud and clear.

CAPCOM Okay.

ANTARES Okay. Commander's going to come in through the foot COMM.

CAPCOM Okay.

PAO Apollo Control, Houston. 113 hours, 10 minutes ground elapsed time. Mission Control Center in Houston now receiving data from the portable life support system worn by the lunar module pilot Ed Mitchell. Elec-TRICAL AND ENVIRONMENTAL - FLIGHT Controller says that the data on the lunar module pilot looks good. We're at 113 hours, 11 minutes. Continuing to monitor this is Apollo Control, Houston.

END OF TAPE

PAO Apollo Control Houston, the Telemu advises that we now have data on spacecraft commander Alan Shephard. Apollo Control Houston at GET 113 hours 14 minutes, the crew aboard Antares continuing through their checklist in preparation for their first lunar walk. We'll standby and continue to monitor. This is Apollo Control Houston.

ANTARES Houston, this is Antares, over.

CAPCOM Antares, this is Houston. Go ahead.

ANTARES Okay, first I have your procedure on lost time on the (garbled), let's get coordinated and try through it again, over.

CAPCOM Roger.

MITCHELL What do you suggest, we went through the checklist and when we gave you a call and no response, were you reading us at all.

CAPCOM We were receiving data, but we did not read you on voice. What is your present configuration?

MITCHELL Well I've come off of the (garbled) comm and back on to the ship comm, Al is still set up with his PLSS operating and - he's not reading at the moment but he shouldn't be and we can talk with each other in A, B and AR.

CAPCOM Okay, I understand you. Talk to each other in A, B and AR. The last word that I had from you was when you reported 92 percent oxygen and I believe at that time you were in Mode A. Over. And Al was still on the ship's comm.

MITCHELL Okay, I believe that's correct.

CAPCOM Now is Al in Mode A at the present time?

MITCHELL No, he's in AR at the present time. You're right that's the last time you should have heard me I guess since the last time I figured you heard me was at that point and I was on a -

CAPCOM Okay We should have heard you subsequent to that, but that is the last time that we heard you. And standby and we'll have some procedures for you in a minute.

MITCHELL Okay.

CAPCOM Ed, this is Houston. We request that you return to the beginning of the first comm check mark, indicated at 18 minutes on the EVA one card, and verify all switches. If you'd like to read them out as you go through why we'll check them off down here too. Over.

MITCHELL Okay, here we go.

CAPCOM And in the meantime would you have Al unstow his plus antenna and see if that helps any?

MITCHELL We've already done that.

CAPCOM Roger, out.

MITCHELL Okay, you want us to go through and verify our power down circuit breaker configurations, is that affirmative?

CAPCOM Negative. You can start - we got comm modulator FM confirmed down here and we see T.V. sense pulses so that's good. Start out with CDR's audio panel.

MITCHELL Okay, I am back - wait a minute - I am back in CM right now, Bruce let's go to FM and try it.

CAPCOM Roger, we had had FM in the we didn't catch you switching back.

MITCHELL Okay, I'm going down this now.

CAPCOM Roger.

CAPCOM Ed, this is Houston, how do you read?

MITCHELL Houston, this is Ed, loud and clear.

CAPCOM Okay, got your in FM we're presently receiving no data in FM, let's press on to CDR's audio panel.

MITCHELL EV closed.

PAO The crew on Antares are back-tracking through some of the portable life support systems communications procedures. Back-tracking because of an apparent

MITCHELL CDR audio panel - CDR audio panel.

CAPCOM Okay, CDR audio panel.

CAPCOM Ed, this is Houston, over. Antares - Ed, this is Houston, over. Antares, Antares, this is Houston. Over.

MITCHELL Houston, this is Ed, how do you read now?

CAPCOM Ed, this is Houston, loud and clear. How me?

MITCHELL Okay. Bruce, it seems like I lost you when I went to relay on on my panel, I get misappropriation but still on Antares COMM. Is it not?

CAPCOM Roger. That's affirmative Ed. And before you press on from here we'd like you to take the modulate switch which is - standby.

MITCHELL Yeah, but I don't know what he said, a lot of static came on the line. The relay - relay's on (garbled) Okay Houston, how do you read now?

CAPCOM Standby please Ed. Go ahead Ed.

MITCHELL Okay. Okay, you wanted me to change the modulate switch to PM - is that affirm?

CAPCOM Negative, that problem is cleared up, we're now receiving FM data, so cancel that transmission.

MITCHELL Okay. I'm at the point now of going back to the LMC audio panel, I will now transmit again until I get all

CAPCOM Standby Ed. Hold at your present configuration. Over.

MITCHELL Got you. I'm holding. And Houston, Al can read you part of the time and not part of the time. I think it's because the relay's off over here right now.

CAPCOM Okay Ed, is - is that a change from previous configuration? That is - was Al not receiving us at all before and he's now receiving us intermittantly.

MITCHELL He's receiving you.

CAPCOM Okay. Very good. I think it has to do with the relays switch as well, let's ignore that and go on for the moment.

CAPCOM Standby please.

MITCHELL (garbled) Houston, Antares.

CAPCOM Go ahead Antares.

MITCHELL I think a lot of this noise is coming when I hit the (garbled) panel simultaneous with my key in my umbilical.

CAPCOM Roger, I'm not copying the noise that you're referring to.

MITCHELL Okay, then maybe its only noticeable to us.

END OF TAPE

MITCHELL I don't know what it is. They're trying to figure out what wrong with their com. They won't let me go on until they fix it.

CAPCOM Ed, this is Houston. At the present time we are verifing our site configuration, that's the reason for the hold at this point.

MITCHELL Okay, you are verifing your own configurations, is that affirm?

CAPCOM Thats affirmative.

PAO Apollo Con - -

MITCHELL Get your antenna down before you break it off.

PAO Mission Control and Ed Mitchell continuing to troble shoot the communications dif - communications dificulties in the - -

MITCHELL (GARBLE) looks great.

SHEPARD Put it any place.

SHEPARD (GARBLE)

PAO Trouble shooting going on with the communications dificulities in the crew members portable life support system.

MITCHELL As of right now, we are only 20 minutes behind time.

CAPCOM Ed, this is Houston.

MITCHELL Yep.

CAPCOM Ed, we would like you to put the relay switch on your panel to on for about 20 or 30 seconds during which time we will try to establish communication with Al who I understand is still on AR and if that is unsuccesfull after about 20 or 30 seconds go back to OFF. over.

MITCHELL Okay, stand by. Let me verify his configurations, alright. You should be in AR, okay, you are in AR. Their are going to call you.

MITCHELL Okay, bruce. On my mark I will go to relay ON. And stand by for your call. In 20 or 30 seconds I'll come back and they'll call us.

SHEPARD Roger Ed.

MITCHELL Okay, 3 2 1 mark. They are going to call you.

CAPCOM Antares, Antares, this is Houston calling Al, do you read over?

CAPCOM Al, Al, this is Houston, do you read?

CAPCOM Antares, do you read over? Antares, this is Houston, do you read over? Antares, this is Houston. Do you read, over?

MITCHELL Okay Bruce, this is Ed, we both read you loud and clear. Al called back but you could aparently not read him.

CAPCOM Roger, we understand you were both, you through the LM and Al through the PLSS reading us loud

CAPCOM and clear. We heard nothing from you.

MITCHELL Okay. (GARBLE) that's probably the next thing we will try. Apparently the relay switch must be working, we were reading him. Houston, as a matter of suggestion, remember we have been in secondary transmitter receiver since before PDI, and I don't know that we have ever establish that our primary is good or not good.

CAPCOM Roger, we copy, and would you verify that the commander is either in the VOX mode on the first or is he pushing to talk?

MITCHELL Al, were you in VOX mode for sure? Thats a verify, he was in box mode and I was reading in com.

CAPCOM Roger, understand you were reading him one board.

MITCHELL That's affirm. (GARBLE) Right. It didn't look that big when we came over.

CAPCOM Antares, Houston, over.

MITCHELL Go ahead Bruce.

CAPCOM Ed, we would like to reverse the relay configuration on your com panels, the summary of the changes are that on the commanders panel, you will have the relay switch ON. You will be in VHF ATR and B receive. On the LMP pannel, relay switch will remain off and you will go to VHF A off and VHF B off, over.

MITCHELL Okay, we've got it. We will reverse the LMP and the PDR W panels.

CAPCOM Roger, and are you up on LM COMM now? Are are you back up on the PLSS?

MITCHELL No, I'm still on LEM com. Bruce, don't you want to try communicating with Al just with his relay on it before I can do anything else?

CAPCOM Roger, if you can set us up in this LEM configuration, we can attempt to contact Al through the relay mode.

MITCHELL Okay.

CAPCOM If no contact in about one minute, why, you had better go back to the mode we've got now and contact us.

MITCHELL Okay, will do.

MITCHELL Okay, Al, put your PRTR relay on, relay on.

SHEPARD On.

MITCHELL Mode VOX.

SHEPARD Mode VOX.

MITCHELL VHF ATR B receive.

SHEPARD VHF ATR B receive.

MITCHELL B received.

SHEPARD B received.

MITCHELL Okay, the lines good. TR TR off, VOX ATR B receive, Okay, now give them a call.

SHEPARD Houston, this is Al, how do you read?

CAPCOM Al, this is Houston, loud and clear. How us over?

SHEPARD Houston, this is Al, how do you read?

MITCHELL They're reading you.

CAPCOM Al, this is Houston. We are reading you loud and clear. LMP's audio - panel - -

SHEPARD I'm not reading them.

CAPCOM LMP's audio pannel should be VHF ALPHA and BRAVO off, over.

MITCHELL Houston, that's affirmative, ALPHA and BRAVO are OFF. I am reading you, Al does not seem to be, give him another call.

CAPCOM Al, Al, we - -

SHEPARD Houston, this is Al. Testing 1 2 3 4 5 4 3 2 1.

CAPCOM Al, Al, this is Houston. We are reading you loud and clear.

CAPCOM Al, this is Houston, reading you loud - -

MITCHELL Give him a long count and let him, give him a long count and let him try to adjust his volum and see if that is part of it.

CAPCOM Al, this is Houston. Long count. 1 2 - -

SHEPARD I can hear you now.

CAPCOM 3 4 5 6 7 8 9 10. Adjust the wheel for Houston. 9 8 7 6 5 4 3 2 1. Over.

MITCHELL Both of them are maximum and can't hear anything.

CAPCOM Okay.

MITCHELL Houston, He has full volume up and it is not receiving.

CAPCOM Roger. How is he reading you?

MITCHELL Do you read me Al, are do you hear me through here? Okay, he is not reading me, we are just talking in the cockpit.

CAPCOM Ed, this is Houston.

MITCHELL I'm back on audio.

CAPCOM Ed, this is Houston -

MITCHELL (GARBLE)

CAPCOM verify that Al is in the AR mode.

MITCHELL Go in AR.

SHEPARD I'm in AR.

MITCHELL Okay, verified.

CAPCOM I understand that you have gone to the extreme position on the volume control.

SHEPARD I'm back in AR.

CAPCOM I understand Al's gone to the extreme position on the volume controls. I'll give you a long count here and why don't you have him circle or run the wheels from one end to the other and see if at any point along the line he receives anything. Over.

SHEPARD Okay, rev back on that wheel all the way Ed.

MITCHELL Yea, I saw the way you, the way you cycled it, all one way then the other.

SHEPARD Yea.

MITCHELL We have already done that and we still don't receive anything.

CAPCOM Roger. Out.

END OF TAPE

MITCHELL Counterclockwise is thataway.
MITCHELL As you look at it counterclockwise, right? As you look down counterclockwise.
SHEPARD Yeah.
CAPCOM Ed. This is Houston.
MITCHELL Go ahead.
CAPCOM Ed we'd like you to set up with yourself in mode Alpha. Al in mode Bravo and attempt a COMM check between the two of you and you with us. Over.
MITCHELL Okay. Say again which one you want which.
CAPCOM We want Al in mode Bravo and yourself in mode Alpha.
MITCHELL Okay. Al in Bravo. Me in Alpha and we will try our COMM check again.
CAPCOM Roger.
MITCHELL Bravo.
MITCHELL Houston for that check. That verb do you still want VHF A, VHF B off on the LMP panel.
CAPCOM That's affirmative and on the Commander's panel it's AIR and B received. We have reversed the relay routing through the CDR and LMP audio panels.
MITCHELL Understand that.
MITCHELL Does your ATR and B receive, right.
SHEPARD Right.
MITCHELL Okay. Let's - you go Bravo. I go Alpha GARBLE on the PLSS. GARBLE.
SHEPARD Hold it still. GARBLE just a minute.
PAO This is Apollo Control, Houston. The crew aboard Antares essentially in a hold in the crew check-list. Experienced difficulties with the portable life support systems communications. We'll standby and continue to monitor. This is Apollo Control, Houston.
CAPCOM Ed, this is Houston. How do you read on Alpha.
MITCHELL GARBLE trouble. I think that circuit breaker was off.
CAPCOM Ed, this is Houston. Now do you read?
MITCHELL Houston. This is Ed, how do you read?
CAPCOM Loud and clear, Ed.
MITCHELL Check to make sure your audio circuit breaker is in.
SHEPARD Okay. It's in.
CAPCOM Ed this is Houston. Loud and clear.
MITCHELL That's good. GARBLE.
MITCHELL You go to B. I go to A.
SHEPARD I'm B.
CAPCOM Ed this is Houston. Over.
MITCHELL Houston this is Ed, how do you read?

MITCHELL Houston this is Ed. How do you read?
CAPCOM Ed this is Houston. Loud and clear.
SHEPARD This is Al, how do you read?
CAPCOM Al, this is Houston.
MITCHELL I'm going to try once more.
CAPCOM Al, this is Houston. If you're in mode B you shouldn't be able to read me but I'm reading you loud and clear.
MITCHELL Let's go to AR now.
SHEPARD Let's go to AR. Reconfigure the vent.
SHEPARD Put your relay on. No, no leave it right where it is. Doing fine. Don't touch a thing.
MITCHELL Okay. Houston this is Ed, how do you read?
CAPCOM Ed, this is Houston. Loud and clear. How me. Over.
MITCHELL Roger. Loud and clear. Try Al.
SHEPARD This is Al. How do you read, Houston.
CAPCOM Al, this is Houston. Loud and clear. How me? Over.
SHEPARD Loud and clear.
CAPCOM Hey, beautiful.
SHEPARD Okay. I think we got our problem solved.
CAPCOM Okay. The word from down here is don't touch a thing.
SHEPARD Yeah, we're in good shape. We're just going to leave it right where it is.
CAPCOM Okay.
SHEPARD Okay, where are we in the great scheme of things?
MITCHELL Okay. Right in through here. We've done all our COMM check.
SHEPARD All right.
SHEPARD We're still in FM, are we not?
MITCHELL Yea. We want to stay in FM.
SHEPARD Okay.
MITCHELL Circuit breakers in.
MITCHELL Fine systems prep.
SHEPARD Okay. I'll read out for you. Panel 16, cabin REPRESS verified closed. GARBLE circuit breakers.
MITCHELL Okay. Go again.
SHEPARD Verify cabin-REPRESS breaker closed.
MITCHELL Okay.
SHEPARD suit fan Delta P open.
MITCHELL Suit fan, Delta P open.
SHEPARD Suit Fan 2 open.
MITCHELL Suit fan 2 open.
SHEPARD GARBLE. I'll get it.
MITCHELL Okay.

SHEPARD And I got a master alarm. The fifth -
MITCHELL Okay.
SHEPARD Is the GARBLE COMM light on?
MITCHELL It will take a few minutes.
SHEPARD We should check and see if it's on.
MITCHELL GARBLE.
MITCHELL Okay it must be -
MITCHELL Just take a little while for it to run down.
MITCHELL GARBLE.
SHEPARD Okay. CPS converter full egress.
MITCHELL Okay. Full egress.
SHEPARD GARBLE egress.
SHEPARD GARBLE relief auto, verify.
SHEPARD I'll get 'em.
MITCHELL Okay.
SHEPARD Put the relief forward.
MITCHELL Standby.
SHEPARD TEMP gas return in egress.
SHEPARD Okay. Ready for the OPS hookup.
MITCHELL Okay. OPS hookup.
SHEPARD Go on you first.
MITCHELL Okay.
SHEPARD Move the 02 actuater if you will bend over a little bit.
SHEPARD GARBLE OFF.
MITCHELL DOFF but yeah it's back up Ken.
MITCHELL I'll put it down for you.
SHEPARD Okay. Give it to me.
SHEPARD Up and away we go. All snapped up nice and clean on top.

END OF TAPE

SHEPARD Okay, two actuators unstowed and are connected to the RCU.

PAO With the comm difficulty cleared up - cleared up, Antares is about 50 minutes behind in the timeline.

SHEPARD (garble) loosened. Disconnected - disconnect to one of the hoses.

MITCHELL Al, hold up here, I'm slow.

SHEPARD Okay.

MITCHELL better get your antenna down before you break it (garble).

SHEPARD Okay, the LM hoses are off, and we'll lay them down there.

MITCHELL Good.

SHEPARD Okay just those two hoses to PGA.

MITCHELL Those two were secured for the ECS system.

SHEPARD Right.

MITCHELL 2 CO_2 H_2O (garble)

MITCHELL (garble)

SHEPARD Okay, here it is. And you need a purge valve.

MITCHELL Okay, a purge valve.

SHEPARD Okay, we've got a purge valve. It's closed, on and trimmed and running a little slow.

MITCHELL Okay.

SHEPARD Do you know where this thing is, Ed?

MITCHELL Yeah. Here it is. ON to AUT.

SHEPARD Ed.

MITCHELL Yeah.

SHEPARD Okay. (garble)

MITCHELL (garble) ball PGA (garble) valve to niner.

SHEPARD Okay.

SHEPARD (garble) are vertical and repeat with me.

MITCHELL Okay -

CAPCOM Antares, this is Houston -

MITCHELL (garble) right there.

SHEPARD (garble - both talking at same time)

MITCHELL Go ahead, Houston.

CAPCOM We'd like to ensure that you reset the master alarms on the water sep and we'd like you to verify which panel has a relay mode ON. Over.

MITCHELL We've a problem with the (garble). Stand by, Houston.

SHEPARD Turn it on.

MITCHELL It was - it was hung up on the cover when it came up. It's still loose. Okay, that's -

SHEPARD Okay, the master alarm has been reset, Houston.

CAPCOM Okay, Al. Which audio panel has the relay switch on? Over.
Shepard (garble)
CAPCOM Roger. Out.
MITCHELL It will stay that way because we've got a problem over on that one. Oh, we do have two problems. The first one was right there. The second one was here with the computer.
SHEPARD Okay.
MITCHELL Okay.
SHEPARD Ready? (garble) to connect these babies.
MITCHELL Okay.
SHEPARD The bulk (Yawn) okay (garble) two loads.
MITCHELL Okay. A PF on 2.
SHEPARD PGA (garble). Okay, and we have a purge valve. Okay, (garble) verify low. Bulb? Okay. Got low.
MITCHELL Okay see where the apple is.
SHEPARD Okay?
MITCHELL Okay.
SHEPARD Next.
MITCHELL Okay, get your diverter valves vertical.
SHEPARD There you are.
MITCHELL Okay.
SHEPARD Okay. Push your (garble).
MITCHELL Great.
SHEPARD Push your (garble).
SHEPARD (laughs) Ed. Alright.
MITCHELL I think they put champagne instead of iodine in the LM water this time.
MITCHELL Okay present your legs.
SHEPARD Okay, you can close the descent water valve.
MITCHELL Okay, descent water valve. Closed.
SHEPARD Okay, Right down here. Back to reposition.
MITCHELL Okay. (garble).
SHEPARD Fan on.
MITCHELL Pull that leg over there and hold it. and strap it down. Tighter.
MITCHELL Okay.
SHEPARD Okay.
Mitchell Okay, purge fan on. Right (garble) cleared. (garble) cleared.
SHEPARD My right leg is cleared, tone is stopped.
MITCHELL Okay, my tone is stopped. Don helmets.
SHEPARD Okay.

CAPCOM standing -

SHEPARD You're what?

CAPCOM Standing by.

SHEPARD Okay, is your back pack position okay?

MITCHELL (garble) a mouth full of microphone and I can't get a drink.

SHEPARD Hey, get that buddy and latch onto it.

MITCHELL Alright. I don't mind at all.

SHEPARD Okay, I think that baby is about ready.

MITCHELL Okay, let's snap it on.

SHEPARD That was the drink port.

PAO Standing by for a go for cabin depres.

MITCHELL (garble) I'm going to check in the back.

SHEPARD Houston, this is Al, are you following us on the checklist now?

CAPCOM That's affirmative, Al.

SHEPARD Okay.

END OF TAPE

ANTARES Okay when you're ready to glove, let us know.

ANTARES Yeah, it looks like we're still situating. Okay. They got - they got your comp material cable at you work.

SHEPHARD Yes. Okay, helmets on.

MITCHELL Helmets on.

SHEPHARD Let's go EVA.

MITCHELL Translever on.

SHEPHARD Right.

MITCHELL (garbled)

SHEPHARD That's down right.

MITCHELL Okay, let me look back there Al. I hate to trust it without looking.

SHEPHARD Okay (garbled)

MITCHELL Okay. Levers are both on.

SHEPHARD LTG is as required.

MITCHELL There's something we're missing, better go back and do that twice.

SHEPHARD What? You'll be incorrect.

MITCHELL Yeah. It's when we were in recycle.

SHEPHARD Did we. Yes, yes we did.

MITCHELL You still have some Irish penants floating loose her

SHEPHARD This is real slow (garbled)

MITCHELL Let's go, ready to go. Back on you Its locked now, didn't lock before. Now we figured it when you're getting your (garbled) Ready to go? Okay. Yeah, that's good.

SHEPHARD Okay.

MITCHELL Okay, we're ready to go LTG (garbled) to the

SHEPHARD I'll bring the LTG. Don't forget disconnect the LTG control as it is.

MITCHELL Okay

SHEPHARD And we can open up the LCG bump circuit breaker on your circuit breaker panel. And

MITCHELL LCG pump circuit breaker open

SHEPHARD Okay, and got your LM water hose.

MITCHELL Connect PLSS water hose.

SHEPHARD And -

MITCHELL Get the umbilical out the way also.

SHEPHARD And we'll have to get this - get this hang up. (garbled). Okay, hold it.

MITCHELL Okay. Got it.

SHEPHARD Okay. Get the water hose there.

MITCHELL Yes, they're all connected.

SHEPHARD Okay, let me verify helmet and visor and linement adjusted.

MITCHELL Okay.

SHEPHARD (garbled) now. Adjusted three oxygen connectors locked.

MITCHELL Okay.

SHEPHARD Three oxygen containers locked.
MITCHELL Three, two, three didn't lock right.
SHEPHARD Okay, (garbled) one first valve locked.
MITCHELL First valve locked.
SHEPHARD Check your water connector.
MITCHELL Locked.
SHEPHARD The intercom connector.
MITCHELL It's locked.
SHEPHARD T.V. to me.
MITCHELL Okay. (garbled)
SHEPHARD Okay, the lever.
MITCHELL (garbled) turned on.
SHEPHARD CRU light.
MITCHELL Yes.
SHEPHARD (garbled)
MITCHELL Okay, both connectors.
SHEPHARD One there red, one there blue, locked. One there blue locked, okay?
MITCHELL purge valve on.
SHEPHARD purge valve on and locked.
MITCHELL Water connector.
SHEPHARD Water connector is on and locked.
MITCHELL One connected.
SHEPHARD One connector is on and locked.
MITCHELL Okay.
SHEPHARD Ready for EVA circuit breaker configuration.
MITCHELL Let's go circuit breakers.
SHEPHARD N - E -

END OF TAPE

SHEPARD Okay, its regularily configured here.

MITCHELL Okay, I verify no problems in the right handed window, you can try the jettison bag.

MITCHELL (GARBLE)

SHEPARD Okay.

MITCHELL Okay, we can down EV plug.

PAO Crew now verifing their suit assemblies.

MITCHELL Okay. Verify your wrist locks and you gloves straps. Oh, you not on yet.

SHEPARD Not quite.

MITCHELL The strap.

SHEPARD Well lets see now. Arm rest.

MITCHELL Okay, we'll get it in a minute.

PAO Downing their gloves now.

SHEPARD Okay. My gloves are on now and --

MITCHELL Thank you.

SHEPARD Okay.

MITCHELL Okay. Let's flip the converter to minimum.

SHEPARD Okay (GARBLE)

MITCHELL Verified minimum

SHEPARD Minimum.

MITCHELL Turn your pump on and that's to the right.

SHEPARD I'm coming on now. Okay, can hear it running, feel it getting cool. (GARBLE) egress Okay, ready to put mode 02 on. Put 02 on. Ok 025 (GARBLE)

PAO The crew now starting a - -

SHEPARD 02 coming up.

PAO preasure integrity check.

SHEPARD This side clear. 3.2. 02 side clear 3.7 Pete are you ready for the one minute check.

CAPCOM Am I reading you?

SHEPARD Okay, try. Okay, do you read me now?

CAPCOM Yes, sure do.

SHEPARD I was reading you.

CAPCOM Yea.

SHEPARD Okay.

CAPCOM Okay, you ready to bring PLSS 02 up?

SHEPARD Okay, where are we.

SHEPARD We'll do it at 20 coming up.

CAPCOM (GARBLE) Gage decay

SHEPARD Okay, my 02 is off.

SHEPARD Okay, Houston, we're one minute. Both suits are tight. Plss 02 is going back on and we are standing by for cabin depress.

CAPCOM Roger stand by Antares.

CAPCOM Antares, this is Houston. You are go for cabin depress. Be sure and give us a mark when you

CAPCOM start your watch. At the second depress.
SHEPARD All okay. Okay, circuit breaker cabin repress open.
MITCHELL Okay, open now.
SHEPARD Cabin repress valve closed.
MITCHELL Closed now.
SHEPARD Okay, and lets check the -
MITCHELL First lets get the over head, I think it would be easier, don't you?
SHEPARD I can get the forward one.
MITCHELL Okay.
SHEPARD I'll go down and get that. Let me know 1, 3.5.
MITCHELL Okay, I think I'm going to be in your way.
SHEPARD No, I'm alright.
MITCHELL Is that it. Okay, drop her on down.
SHEPARD Good, good.
MITCHELL Can you get the latch out of the way?
SHEPARD I don't know. There we come.
MITCHELL Okay. Rev 3 4 5. Move forward.
SHEPARD Rev 3 5.
MITCHELL Okay, not quite, but your on now. Theres 3 5 and holding. Okay.
SHEPARD I've got 4.9.
MITCHELL 4.85 and holding.
SHEPARD Okay.
MITCHELL Okay, cabin's at 35.
SHEPARD (GARBLE)
MITCHELL is 45.
SHEPARD Okay.
MITCHELL PGA is forward and coming on down.
MITCHELL We are ready to start our watches.
CAPCOM Roger, give us a mark.
SHEPARD Okay, 3 2 1 mark it. We're off and running. Time 0.
MITCHELL Okay. Over here, let's see forward dump valve open now.
SHEPARD Okay, all good now.
SHEPARD Okay, turn on.
MITCHELL Turn on water flag A.
MITCHELL Water flag A. 9 lbs preasure. Calm cabin. .65 on the cabin and a half a pound in the cagin. You might see if you can get the door open.

END OF TAPE

MITCHELL I'm going to drop a little bit more. It's pretty loophole there.

SHEPARD Yeah, you got a lot of surface area in that hatch.

PAO Cabin DEPRESS at 114 hours, 19 minutes.

SHEPARD Don't try now.

MITCHELL GARBLE. GARBLE.

SHEPARD Okay, it should be almost zero now.

MITCHELL Okay, we're showing a tenth of a pound right now.

SHEPARD There it comes.

MITCHELL Okay. Final prep, PLSS feed.

MITCHELL PLSS feed water.

SHEPARD Did you hold it for M clear?

MITCHELL Ye, I got it.

MITCHELL Okay, I"ve got it now. Straighten up.

SHEPARD That's silly - you have GARBLE.

SHEPARD There we go.

MITCHELL Okay.

MITCHELL PLSS feedwater OPEN.

SHEPARD Okay.

MITCHELL We're waiting for the water flag.

SHEPARD GARBLE.

MITCHELL Don't have the ECS caution light.

SHEPARD Go ahead, Ed.

MITCHELL Oh, I see. You're going to run dim.

SHEPARD Okay.

SHEPARD Just where you see them over there.

MITCHELL Okay. Getting a water sight clear here in a minute.

MITCHELL Okay LM pg is getting down to about usable pressure or 4.3 now. Picture is dead.

SHEPARD Okay Z42.

MITCHELL We will be able to work in a minute. Okay. GARBLE is good. We have a water sep light. GARBLE.

CAPCOM Ed this is Houston. We're showing your feed loader pressure going up. You ought to be in business shortly.

MITCHELL Roger. Water pressure water flag is clear. That's great.

SHEPARD How's GARBLE.

MITCHELL Pressure is aft, you're water flag about clear?

SHEPARD Don't know -

CAPCOM Al's pressure is rising now it ought to clear momentarily.

SHEPARD Okay, Al's water flag is clear.

MITCHELL GARBLE
MITCHELL GARBLE. Okay.
SHEPARD Okay.
MITCHELL Okay.
SHEPARD (garbled) dim.
MITCHELL Okay.
SHEPARD (garbled) starts the VET.
MITCHELL All right VET is stopped. Want the hatch the rest of the way open?
SHEPARD Ready.
MITCHELL Two REG monitor. Okay. Forward hatches OPEN. Lower your visor.
MITCHELL Let me get a picture of (garbled)
MITCHELL Can you reach everything now?
SHEPARD Okay.
MITCHELL Stay right there. I'm going to help you.
SHEPARD All the way down.
MITCHELL Right way? Okay, very good.
MITCHELL Now get your antenna as you go out.
SHEPARD All right. Starting out the door.

END OF TAPE

MITCHELL Get your press down low, roll toward me,

SHEPARD Okay, come on over

MITCHELL Okay, there you go. Now you're clear. Get your head down as soon as you can. Back right on out. That's great. Wait a minute, let me get your antenna hold it.

SHEPARD Okay.

MITCHELL you'll hvve to get mine when I come out. Okay, you're clear. Go on out.

SHEPARD Okay, clear of the hatch. Give me a jettison bag.

MITCHELL Roger, let me get over here on the other side so I can get to it.

PAO The jettison bag has materials the crew will not use on lunar exploration.

MITCHELL I'm hung up on something now.

SHEPARD Probably that -

MITCHELL It's the door handle. I got it loose now.

SHEPARD Okay, very good.

MITCHELL Okay, jettison bag coming at you.

SHEPARD Okay. Okay, now standing by for the LEC.

MITCHELL Okay.

PAO Shortly Shephard will be throwing the equipment conveyor belt

SHEPARD While he's working on the LEC, let me comment that it certanly is a stark place here at Fra Mauro. I think it's made all the more stark by the fact that the sky is completely black.

CAPCOM Roger.

SHEPARD Okay, I have the conveyor now. Have the bag. And it's deployed, and standing by to deploy the MESA. And the MESA has released properly Houston.

CAPCOM Roger, Al.

SHEPARD Starting down the ladder.

CAPCOM Roger.

PAO The MESA has been deployed.

CAPCOM Okay Al, beautiful, we can see you coming down the ladder right now, it looks like you're about on the bottom step. And on the surface. Not bad for an old man.

SHEPARD Okay, you're right. Al is on the surface, and it's been a long way, we're here. Now I can see the reason we have tilt because we landed on a slope, the landing gear struts appear to be about evenly depressed.

CAPCOM Roger, Al.

SHEPARD I'm moving around, getting familiar - getting familiar with the surface. The surface on which the forward foot-pad landed is extremely soft, as a matter of fact its in a small de-pression. The - the soil is so soft that it comes all the way to the top of the footpads, it even folded over

SHEPARD the sides to some degree. The same is true of the plus-y strut.

CAPCOM Roger.

SHEPARD Okay, we'll move on over. Take a look at Fra Mauro, or take a look at Contact I should say. (garbled) where it should be and it's a very impressive sight. And -

CAPCOM Antares, this is Houston, you are go for two man EVA. Over.

MITCHELL Roger, Houston. Thank you.

SHEPARD And continuing, we can see the boulders on the rim. It looks as though we have a good traverse route up to the top of Cone. I can see Cone ridge

END OF TAPE

SHEPARD to the top of Cone. I can see Cone Ridge going on to the north. That's very apparent. I'm moving over to adjust the MESA.

CAPCOM Roger, Al.

MITCHELL Houston. I'm finishing up my check - or paper check and I'll be ready to go out shortly.

CAPCOM Roger. Ed.

SHEPARD Okay, the MESA is adjusted. Going over to remove the MET blanket.

MITCHELL Okay, Al, I'm starting out.

SHEPARD Okay.

PAO Mitchell coming out now.

PAO Shepard tilting the MESA up slightly now to get the MET, which is the pull cart out from under it.

CAPCOM Okay, Ed, we can see you coming down the ladder, now.

MITCHELL And it's very great to be coming down.

CAPCOM Roger. Following step.

MITCHELL That last one is a long one.

MITCHELL And, check, very easy to do. A little push and just spring right up.

CAPCOM I guess we got there with those long leg (garble)

MITCHELL Yeah, sure glad they did too. That's great.

CAPCOM Al, this is Houston. Have you released the MET, yet? Over.

MITCHELL He's releasing it now.

SHEPARD Okay, Houston, the MET is finally clear of the MESA.

MITCHELL Al, I'm going to come over. I'm not getting my antenna out before I lose comm here in the minute.

SHEPARD Okay.

MITCHELL If I go around the corner or something.

SHEPARD Okay, just drop this baby over here.

PAO The MET will be placed on one of the footpads.

MITCHELL (garble)

SHEPARD Okay, if you'll stop here a minute I'll get your antenna out. Stand by one. Okay, you're now deployed. Okay.

MITCHELL Thank you.

SHEPARD Okay, Houston, the MESA has been stowed on the fourth line footpad.

CAPCOM Roger. Out.

END OF TAPE

MITCHELL And going back to adjust the MESA. Mobility very grave up to this pressing 1/6 G hold, Houston.

CAPCOM Now do.

PAO Shepard now adjusting the television.

MITCHELL And looking at Cone Crater Al was looking a short time ago it doesn't appear there is going to be any trouble getting the batt up Cone Crater.

CAPCOM The backup crew copies.

SHEPARD We knew the troops would.

MITCHELL I knew they would.

SHEPARD We knew the troop from the ground would be glad to hear that.

PAO Backup crew here in Mission Control.

CAPCOM Okay, and here comes the lens cap.

SHEPARD The mesa blanket is coming off here loose.

CAPCOM Roger. Mesa blanket.

SHEPARD You'll lose television for a moment.

SHEPARD Okay. That's beautiful.

MITCHELL Okay when you are.

PAO The foil coating now off the MESA.

MITCHELL Let m give you a hand and we'll get it done.

SHEPARD Okay. Got it back ON?

MITCHELL Yeah.

SHEPARD Really. Great.

SHEPARD Okay the lens cap is going on now Houston. Want me to set up a tripod.

CAPCOM (garbled) this is Houston request EMU status checker.

MITCHELL Okay, Houston. LMP is 3.75 PSI. GARBLE. 85 percent, all flags GO.

CAPCOM Roger, men cooling.

SHEPARD Men cooling.

MITCHELL Men cooling.

CAPCOM Go ahead Al.

SHEPARD Okay CDR here with 81 percent, PDR is 81 percent, 3.75, no flags, men cooling.

CAPCOM Roger. Out.

PAO You're looking good down here. Shepard now setting the TV up on a tripod.

MITCHELL Houston, GARBLE, getting that television overhead and getting my contingency sample put it all the way.

CAPCOM Roger, Ed.

PAO Mitchell now getting the contingency sample. This should be about 2 to 4 pounds of lunar materials.

MITCHELL Houston, the contingency sample is being taken about 25 feet to the to 0100 position of the LM, MITCHELL adjacent to a - got a five foot crater and I'll identify it for you later.

CAPCOM Roger out.

END OF TAPE

CAPCOM Roger. Out.

MITCHELL Do you want to watch the cable as they go out?

CAPCOM Al, this is Houston. Would you verify the lens is still capped. Over.

SHEPARD That's affirmative.

CAPCOM Roger.

PAO Shepard positioning the television to get a view of the MESA and ladder area on Antares.

SHEPARD (garble) Okay, it's about 50 feet, I would say.

MITCHELL Why don't we get all the cable out while we're at it?

SHEPARD Very good, pull it (garble).

MITCHELL Okay. Let me get this contingency sample folded up.

PAO The television being positioned about 50 feet out.

MITCHELL Okay, Houston, our line scan is off. We're aiming for the general area of mesa. Al, could you pull the rest of this cable out away from the MESA area.

SHEPARD Yeah, you've got about 30-foot zoom under there, look.

CAPCOM Okay, I think you can zoom in a little more. Let's try at 40 here.

CAPCOM Okay, and on the F stop, Al, we'd like to stop it down one additional stop. That's toward the higher numbers.

SHEPARD Okay, it's going from 22 to 44 and I will zoom it to forty - stand by.

CAPCOM Okay. Hold the zoom there and the position looks good, also.

SHEPARD Okay, how about the F stop?

SHEPARD Is the F stop satisfactory for you?

CAPCOM Al, this is Houston. See if you can stop it down a little more. Run it up - run the diaphragm ring up against the stop, there. It's still a little bright.

SHEPARD Okay, right up against the stop.

MITCHELL It's against the stop, Houston.

CAPCOM Roger. Stand by.

CAPCOM Al, this is Houston. Request you go to peak control.

SHEPARD Okay. Going to peak.

SHEPARD (garble) satisfactory?

CAPCOM Okay, Al, now, we'd like to open it up to F-22.

SHEPARD Okay.

END OF TAPE

SHEPARD Okay, this is the f attachment to F22, ready to go?

CAPCOM Roger.

CAPCOM Al, this is Houston, would you confirm that you're at f22 now.

SHEPARD Okay, I'm confirming that I'm in peak and I'm at F22.

CAPCOM And while we're waiting for the television adjustment the 2:30 position approximately 50 feet where the camera is, is slightly uphill we see that the back land on the elevation. The Down Slope.

CAPCOM Al, this is Houston -

SHEPARD You can see almost a basin, go ahead

CAPCOM Roger, Al this is Houston, we'd like to go back to average and f44 stop down all the way and then leave it there.

SHEPARD Okay, this is the last adjustment. f 44.

CAPCOM Roger, and back to zoom out to about 35.

SHEPARD And - and I'm going to average. And back to zoom out to 35. And how does that look?

CAPCOM Beautiful.

SHEPARD Okay, pressing on. The S-band antenna.

CAPCOM Roger, press.

SHEPARD Again continuing - continuing, the soil is very fine here. Fine grain and as we mentioned before there are very few samples that are of any size at all. Mostly ant sample size and a box of generally under two inches or less.

MITCHELL Houston, as you can see the SSC cable is deployed. BB is emptied and I'm putting the lot of testers in it now.

CAPCOM Roger Ed, and you did leave the contigency sample on the ladder?

MITCHELL That's affirmative, that's where it is.

SHEPARD Houston, it looks as though we've landed in a fairly rough place.

MITCHELL Yes, indeed it does. I understand you got your front landing gear into a hole.

PAO Beat heart rates for both crew members who were just off the ladder, Shepard down at 120, Mitchell at 124, reading now in the 70 to 85 range.

MITCHELL Okay Houston, I have the - can you see Al, getting up to the flag.

CAPCOM Roger Ed.

MITCHELL Am I still in your field of view Houston.

CAPCOM That's affirmative.

PAO Mitchell deploying the solar end experiment now.

SHEPARD Okay, Al's bring the S-band antenna around.

CAPCOM Roger Al, we're watching you.

SHEPARD You see.

PAO Shepard moving towards us now.

END OF TAPE

PAO Now setting up the erectable S band antenna, that's Al Shepard.

MITCHELL Time Houston, we have (garbled) in place.

CAPCOM Roger, Ed. That's 114 plus 53 plus 48 GET. SWC.

MITCHELL Okay.

PAO Solar wind experiment now positioned by Ed Mitchell.

MITCHELL Houston, the LR tubes coming off.

CAPCOM Roger, Ed.

PAO Al Shepard is deploying the S band antenna legs at this time.

CAPCOM Al, this is Houston. If you would give us the commentary on how the legs go into the surface.

SHEPARD Okay, the legs are in the surface approximately 1 inch, I would say, due to the fairly equal all the way around perhaps the legs of the last is in an inch and a half.

CAPCOM Roger, we were driving more at force penitration and did you meet any rocks or anything like that?

SHEPARD I didn't attempt to run any kind of experiment.

CAPCOM Roger, I copy.

SHEPARD Forcing the legs down I just -

PAO Shepard has positioned the antenna legs into the lunar surface.

MITCHELL Here comes the S band antenna cable.

CAPCOM Looks more like a kangaroo.

MITCHELL Al, you're too far away. It should have more cable than that, its hung up.

MITCHELL Okay, Al, we were in respect to the cable. I'm afraid you're too far away.

SHEPARD Well, go on to get maximum length for moving on in.

MITCHELL Thats better. It looks big. Yea, I want to do that to.

END OF TAPE

MITCHELL Is it off? Oh, good, Al.
SHEPARD Okay, we'll bring it in.
MITCHELL Right over here. Right about in here anywhere will probably do it.
SHEPARD We ought to put it right here to get it level.
MITCHELL Okay.
SHEPARD Okay. Can you reach that?
MITCHELL Oh yeah.
SHEPARD Okay, if you want to stand clear, we'll blow the antenna.
MITCHELL Sit her up.
SHEPARD Okay, here we go.
MITCHELL It's hung up at the top.
SHEPARD Base?
MITCHELL Yep. If you'll tilt it over toward me without dropping it, I'll get it unhung for you.
SHEPARD Alrighty.
SHEPARD Ready for it?
MITCHELL Good. Lower it on down.
SHEPARD Okay.
MITCHELL Keep coming. Okay, set her up.
SHEPARD Okay. All kinds of free bees into these simulations.
CAPCOM Roger. I've got the boys in the back room working overtime.
PAO The antenna pops out like an upside down umbrella.
MITCHELL Okay.
MITCHELL Sure you got it?
SHEPARD Seems to be.
MITCHELL Okay, there it is, way up there.
SHEPARD Hey, how does that look (garble)?
MITCHELL Looks like it's getting close. Let me get on the glass.
SHEPARD Very good, turn it to the left a little more.
MITCHELL (garbled) changes a little bit.
PAO Shepard giving an eyeball alinement toward earth.
SHEPARD That's good.
MITCHELL Okay. I don't see it, Al.
SHEPARD I'll just put it back down again.
SHEPARD Okay.
MITCHELL Okay. I think my first, my OPS is hitting is.
SHEPARD Alright. Just a second, let me back about - I'll just pull this a little bit.
SHEPARD Okay, that's about it for azimuth - all come down a little bit.
MITCHELL Okay.

SHEPARD Let me just check through and see if that's the way you want to go.

MITCHELL Okay.

SHEPARD Okay, coming down a little bit.

MITCHELL Here goes.

SHEPARD Hold it.

MITCHELL Back up just a little bit. Right there. Okay, I have the earth centered.

SHEPARD Okay.

MITCHELL Okay, Houston. Boresighted the (garble) dark side and all.

CAPCOM This is Houston. Roger.

SHEPARD Okay. The S-band antenna has been erected and alined and the cable has been attached.

MITCHELL And I'll go back, and the switch.

CAPCOM Roger, Ed.

MITCHELL Okay.

CAPCOM And we'd like to get an EMU status report as you go by.

SHEPARD Okay, the CDI is reading 3.75, reading 76 in the 02. I have no flags, I'm still minimum's low and I'm comfortable.

MITCHELL Okay, and this is Ed. I'm reading 3.75 -

END OF TAPE

MITCHELL IT APPEARS THAT I'm reading 37.5, about 75 percent CO2, no flag, minimum cooling and I'm very comfortable.

CAPCOM Roger. Out. Are going to bring contingency sample into the EPR.

PAO MARK 45 minutes since CABIN DEPRESS.

MITCHELL Hey, Bruce is any appreciable dust flying off these boots. I'd like not to take all that dirt in there.

CAPCOM I didn't notice any on the TV.

SHEPARD GARBLE.

MITCHELL Good. Houston, I'm back in the LM.

CAPCOM Roger Ed.

MITCHELL Cut out a great deal of problems. About getting ready to switch to lunar stay. Give me a call and if I don't hear you in about 30 seconds we will go back.

CAPCOM Ed, this is Houston. You're GO to switch to lunar stay. Go ahead.

MITCHELL Ed, Houston, this is Ed, how do you read?

CAPCOM Loud and clear, Ed.

MITCHELL Okay you're on the erectable antenna.

CAPCOM Roger and how are you reading us.

MITCHELL Loud and clear.

CAPCOM Beautiful.

MITCHELL Okay, Owen, I'm ready for the ETB most any time.

SHEPARD Okay, bring it on up.

PAO Shepard now transferring the contingency sample up the conveyor belt, the first lunar material to go to the LM.

CAPCOM And did the contingency sample get in there.

SHEPARD That's affirmative.

MITCHELL Wouldn't never do for us to leave that one behind Bruce.

SHEPARD Okay, well Ed's loading up the ETB.

MITCHELL Don't I wish it -

SHEPARD Ed is loading up the ETB. Oh, Ed is loading up the ETB, sort of a general planning site. We are, in fact, in a you know low area. There seems to be a general swale or a wide valley between the triplet crater and the doublet craters and we are on the down hillside of this particular point. It levels off at a lower elevation to the left of the LM approximately 15 feet lower there and then it starts back up to the rim of doubling. It's a very uneven landing area here and of course like all of the sections that we've noticed pock marked by a minus amount of craters. A surface here as we pointed out is mostly climbs and I hate to discuss any kind ol lineations here that remain in the vicinity of the LM because I can see very definite indications of the

SHEPARD radial thrust pattern caused by the descent engine. And any other lineal -

END OF TAPE

SHEPARD Apparent. Saturated here in the area. There were perhaps half a dozen very large rocks at the 1:00 position from the LM, but perhaps some ejecta from Cone, but they don't seem to have a particular ray pattern. They probably are ejected from Doublet. Because they appear to be closer to Doublet than they do Triplet. They are a lighter gray in material, excuse me - the material is lighter gray in color and I'm certain we'll get some of those samples on the way back from ALSEP deployment. It's very difficult to assess any kind of stratigraphy right now, looking back at it, because we're looking into the sun at a low sun angle, and it's just not the right direction to view that crater or looking for stragigraphy But there certainly are boulders on it. From here it looks as though they are at least 20 feet in diameter, perhaps at least the ones we can see here in the western slope, they appear to be grouped fairly close to the rim of the crater, and not too many large boulders on down the sides of the slopes, the outside rim. Then again, it looks as though the (garble) is traveling slowly forward and slowly to the right, as you'll see from the photographs. That's the direction of the landing gear probes. As they are bent. The foot path plus Y, for example, has a drag pattern of approximately one foot in the dust. Okay, Ed How are you up there?

MITCHELL Okay Al, I've got it loaded and about ready to start down with it now.

SHEPHARD Okay.

MITCHELL Just another minute. I have IFA came loose from the straps and that's being a great major headache.

CAPCOM Okay Ed, before you start transferring, you want to verify contents and ATV.

MITCHELL Okay, let me give you a call on them, Bruce I put in one black and white camera, one television camera, two Hasselblads, one TDS, two 16 mm Mags. and two maps.

CAPCOM Roger, did you get the 16 mm camera with mag. attached?

PAO Mitchell passing equipment back to Shepard, on the lunar surface.

MITCHELL I guess we're going to need that one.

SHEPARD Yeah, that's the one that's supposed to photograph you coming down the ladder.

MITCHELL Oh oh, all of the contingency, the disposal container just fell out on the floor. Just a minute. Got the camera.

PAO Shephard will take pictures - motion pictures of Ed Mitchell as he comes back down the ladder.

SHEPARD Okay Houston, with respect to the erosion pattern, directly into the engine valve there is very little erosion. Most of the erosion occurs about 3 feet to the south

END OF TAPE

MITCHELL (garble) for the period location of the valve. That's probably where the bunch was when the engine was cut off, and the LEM slowly drifted to the north-west, so there.

SHEPARD Perhaps you can see from your cameras Houston, the view off to the south is an undulating hill, and I would estimate that hill back there to the south is, oh perhaps about 100 feet higher than we are.

CAPCOM Roger.

MITCHELL Okay Al, I am ready to bring this down.

SHEPARD Okay.

MITCHELL Wait a minute. Got it.

SHEPARD Okay.

MITCHELL Okay, let her come gentily.

SHEPARD All righty.

SHEPARD Okay, just a second here and we'll give it a little more attention. Coming over the sill, put a little more attention please there you are. Okay, coming over the steps now. Okay, prepare the steps and I'll take it down slowly.

MITCHELL Do you have it in hand.

SHEPARD negative.

SHEPARD Just hold it right there for a minute. Okay ease it down a couple of feet. Okay I have it now, thank you.

MITCHELL And it is all yours.

SHEPARD Very good I've got it.

MITCHELL Right coming out again.

CAPCOM Okay, we'll give Al a few seconds to get the camera -

PAO The equipment bag is down now as advertised. We're at 56 minutes since cabin repress or depress. The bag being attached to the MESA now.

CAPCOM Okay, are you about ready.

SHEPARD Okay stand by one. Okay, one (GARBLE) is coming off. Okay, come on down.

MITCHELL Okay (GARBLE)

PAO Ed Mitchell coming back down the ladder.

MITCHELL But not to far. Tell me when I hit the bottom step.

SHEPARD You're at the bottom step.

MITCHELL I'm on it?

SHEPARE Yep.

MITCHELL Okay.

END OF TAPE

MITCHELL I'm going to miss the LRQ (GARBLE)
SHEPARD Okay.
MITCHELL And I'm down.
SHEPARD Okay, camera stopped, Houston.
CAPCOM Roger.
MITCHELL Okay, not one flag.
CAPCOM Okay, we're right on the time liner. Right to the minute.
MITCHELL Okay, I'll take the camera while you get the flag set up. Okay. I'll go off to the left over there by the SWC. It will be on television.
SHEPARD It will be the best place I guess.
MITCHELL Okay. F 8.
PAO Shepard and Mitchell will deploy the American flag now.
MITCHELL The camera was on 160 and I hope it got bumped there.
SHEPARD Ed, that's where it is supposed to be for you. Roger 28612.
MITCHELL Okay.
SHEPARD Okay got it?
MITCHELL Aim my camera out there at about the right spot.
SHEPARD Okay, let's see. Up there on the right. Be okay.
MITCHELL Let's see where you're pointing.
SHEPARD Over here on the right.
MITCHELL Okay, let me point a little bit further around that way. Get out there in the sunlight with this - -
CAPCOM Antares, Houston. Looks like its going off the camera to the right.
SHEPARD How about that?
CAPCOM Al, this is Houston. We still show you're off - -
SHEPARD Okay, Houston.
CAPCOM Okay, you're coming back in now.
SHEPARD Okay.
MITCHELL Al, we're not going to fool around, we're not going to be able to get it with a 16 now.
SHEPARD Maybe we can put it down here close by, if he wants.
CAPCOM Al, this is Houston. I think it would look a lot better if you could bring it over closer towards the TV.
SHEPARD Okay.
MITCHELL Put it right here in front of us Al.
CAPCOM Yea, maybe on this, on the TV camera, try to the LEM shadow. At 130, 20 feet.
CAPCOM There you go, beautiful (GARBLE)
SHEPARD Okay.

MITCHELL Okay, camera going here.
CAPCOM Give me a mark.
MITCHELL Mark is ready.
CAPCOM Roger, out.
PAO The flag being positioned about 20 feet from Antares.
MITCHELL Hows this Burce, look okay?
CAPCOM Roger, that's a good sight.

END OF TAPE

CAPCOM Roger. That's a good site.
MITCHELL Okay. Going in very easily (garble)
CAPCOM Okay, now you're going off camera to the right.
PAO That's Ed Mitchell in our center view.
CAPCOM Good.
MITCHELL Okay, I'll take a picture this way and then we'll swing it around so they can see us in television.
SHEPARD Alright.
CAPCOM Okay we can see it -
MITCHELL Okay, let me turn it around a little to the (garble) now.
SHEPARD Okay. There we go.
MITCHELL I think I'm still too close to you, Al.
SHEPARD Except for the LM leg.
MITCHELL Yep.
SHEPARD Okay, and when your're through, you can flop it around so they can see it a little better on the DC -
CAPCOM Okay, and which magazine are you using? Over.
MITCHELL Okay.
CAPCOM On the Hasselblad?
SHEPARD Indianapolis, Indiana.
CAPCOM Roger. Indianapolis, Indiana, but that was my line.
MITCHELL (garble) is the TV cable, Al. Watch your TV cable. (garble)
Got them both. Back up. Try it again. Okay, you're clear.
SHEPARD Okay.
PAO The crew is taking each other's picture by the flag.
SHEPARD Okay. Ready?
MITCHELL Ready.
SHEPARD Okay. Got it.
CAPCOM What's the final exposure number?
MITCHELL (garble) give me a good orientation for the flag.
CAPCOM Okay, Ed, if you just turn it broad side -
SHEPARD 5 25.
CAPCOM If you turn it broad side of the TV camera with the field to the TV camera right, there's 180 out from that would be better.
MITCHELL Okay.
SHEPARD There you go. You got too far from the mike.
CAPCOM Copy, Al.
CAPCOM Okay, that's good on the flag.

SHEPARD Okay, Houston.
MITCHELL Did you say 16?
SHEPARD No.
MITCHELL Okay. 16 is off, Bruce.
CAPCOM Roger. Stop.
CAPCOM You have about 3 minutes remaining on that magazine Claremont, California.
MITCHELL Rog. We won't change it. Okay, I'm going to press one out for the TV man, Houston.
CAPCOM Roger.
SHEPARD (garble) Ed. While, Ed is doing that, Al is going to proceed with photographing the landing gear.
CAPCOM Roger.
SHEPARD These pictures about the LM.
CAPCOM Roger. Using Indianapolis, Indiana.
MITCHELL Okay, Houston, I will on my first sector per pad, I'll point a little bit more to the south.
PAO Mitchell will take a TV panorama of the area.
CAPCOM 5 on this.
MITCHELL Rog. Okay, you're in zoom with 25; focus (garble) up for an infinity. And how's your picture, Houston?

END OF TAPE

MITCHELL How is your picture, Houston?
MITCHELL Houston, this is Ed.
MITCHELL Al -
CAPCOM Go ahead Ed.
MITCHELL Okay, how's your picture now?
CAPCOM Roger. It looks good. We can now pick up -
MITCHELL Can you see the horizon?
CAPCOM That's affirmative. The horizon is about two thirds of the way up from the bottom of the tube. The flag is over near the left hand corner of the field of view and that lower rise is sort of centered, with the small crater off a foot.
MITCHELL Okay, that's just about where I wanted it.
MITCHELL The horizon that you - the far horizon or is it a ridge that seems to run around this bowl that we're sitting in appears to be a ridge. It runs down from what we called old nameless to the south and it runs to the west. It seems to be roughly circular but of course we could be a little bit deceived at this point on that score. The little rise you see in front of us is
CAPCOM Say Ed.
MITCHELL a rise that showed on the map - the craters are on the map - since I don't have it handy - I'll have to give you the coordinants later but I think that you already know them. They are about 450 feet -
CAPCOM Ed, this is Houston.
MITCHELL South of the - Go ahead.
CAPCOM Roger. If you're going to spend several seconds describing each of these locations here after the camera stays out you might just as well zoom out a ways and we'll pick up some features at random on higher magnification and zoom back in when you go into the next 45 degree sector.
MITCHELL Okay. I've moved around to the next sector now. And, it's looking down over what we used to call Clover Leaf - although it's not obvious from here what the clover leaf was. It is a fairly significant crater about 250 to 300 yards out and I'll try to come bring it in for you.
MITCHELL GARBLE.
CAPCOM Yeah, you're doing fine. Keep zooming if you've got any left. It's well centered.
MITCHELL Okay, let's zoom all the way.
CAPCOM Okay, beautiful.
MITCHELL Okay, that crater is in a low spot, but it's not the lowest spot in this dip that we're in. The lowest spot that we will pick up in out next sector.
CAPCOM Okay bring it back down.
MITCHELL do the process because you won't be able

MITCHELL to see it. Okay.

MITCHELL Al, I've got a sector to the right.

SHEPARD Roger.

MITCHELL Facing almost down sun.

CAPCOM All right, we got your shadow.

MITCHELL Okay, it's a very low spot. The deepest part, I guess, of what we were calling clover leaf before, although I did not realize how deep that depression was and I still don't -

CAPCOM Okay, zoom out while you're talking.

MITCHELL Okay, can't quite get the relief in my mind because it is so different that what I expected. What you're looking at now, this deep part is to the south of doublet and it's probably 75 to 100 feet below where we are.

CAPCOM Okay, you're aimed up a little high.

MITCHELL Up on the far side to above it. Okay, how's that now?

CAPCOM A lot better. Say Ed you don't need to stop talking when I talk if you can do both at once.

MITCHELL Okay. I have a little trouble listening to you and talking at you too. That's not polite. Okay. I'm bringing you back in and coming around through the west - northwest and you should be able to see the distance doublet crater and I've lost it now because of the sun angle but it's just about on the near horizon. I'm sorry there are three mounds. Three regions. The near side, the -

END OF TAPE

MITCHELL The nearside the nearest one the ridge that the Doublet is on and then the far horizon. And I'll bring it on out for you. Doublet is on the second, second hill that you see.

CAPCOM Roger, we can see the ridges, and I

MITCHELL And I

CAPCOM And I can see a crater that probably is Doublet.

MITCHELL Okay. We'll zoom back in and move on around and I think I'll stop to finish up your task over there.

SHEPARD Negative. I'm still working at 8 o'clock.

MITCHELL Oh.

SHEPARD And I just wonder, how come the camera has the audacity to presume that we're wrong about Doublet crater.

MITCHELL Very presumptious.

SHEPARD Okay Bruce, I'm coming around one more sector, and you should be able to - I'm going to move it just a little bit more and you should be able to see the large rock, the four or five rocks I was talking about in my discussion before we got out of the LM.

MITCHELL Now I'll zoom in on those if I may.

CAPCOM Yes please.

MITCHELL Here we come.

CAPCOM Okay, now point the camera down a degree or two.

MITCHELL Okay. How's that.

CAPCOM Beautiful, you might come on a degree or so I see the small rocks off to the right.

PAO The rocks are brighter in the view.

CAPCOM Okay. What's that object in profile on the horizon?

MITCHELL Those are a quadruplet jade of craters.

CAPCOM Point it down a little.

MITCHELL They're right here in front of me, okay. The quadruplet jade of craters starts right here in front of me, about half way between the rocks and myself.

CAPCOM You're getting all sky.

MITCHELL Across here, now there's quite a few - let me zoom back in again.

CAPCOM Roger.
Okay - hold it.

MITCHELL Okay, how's that now?

CAPCOM Good.

MITCHELL Okay, there's the south quadruplet crater and then there's the next one and the next one and the largest one.

CAPCOM Roger. Okay, we probably better go back to zoom 25 and press on with the panorama.

MITCHELL Okay, I'm on zoom 25. And I'm looking almost due north at it now. I'll swing back around and pan for the rocks. There's the rocks we were looking at. Going slowly to the north, you can now see the undulation the region that I was talking about

CAPCOM Roger

MITCHELL There's not a level portion out here, that's more than a few square meters. As you can see there's at least three ridges between us and the horizon. Now I'll zoom in out here once more. Let you see it close - closer in out up there. Another pile of rocks, or ridges.

CAPCOM You're pointing at the sky.

MITCHELL Okay.

CAPCOM That's better.

MITCHELL You need a gunsight on this thing.

CAPCOM You sure do.

MITCHELL That better?

CAPCOM Yeah, the horizon is about one quarter of the way up. Beautiful.

SHEPARD Okay Houston, Al is finished with the documentation, counting at 110.

CAPCOM Roger, Al. 110 Indianapolis, Indianna. and Ed, a frame or two ago it looked like one of those rocks was split right down the middle, did you notice that too?

PAO Ed is taking pictures with the Hasselblad camera.

MITCHELL I don't think it is I - it may be it may look like it from there we'll go by there later on.

CAPCOM Roger. Let's press on with the t.v. panorama.

END OF TAPE

CAPCOM We're about 2 minutes behind timeline at this point, Ed, and you're looking at Sky, again. Bring her down. Okay. Okay, Ed, we're recording all this on video tape so that it only takes a relatively brief period of time looking at the scene that we can play it back frame at a time later on. Back at 25?

PAO The scientists in the back room at Mission Control making hard copies of this television to -

MITCHELL Ed. Are you reading, Houston?

CAPCOM Ed -

MITCHELL Don't look like Ed's reading anybody.

CAPCOM Ed, this is Houston, we're not reading you.

MITCHELL Okay, Bruce, now you're all right I hit the transmit switch to off.

CAPCOM Roger, loud and clear.

MITCHELL (garble)

MITCHELL The horizon that you see in this view is an old flank leading up to Cone Crater. It's over a mile away - a mile and a half away. I'll give a quick zoom in on it. And then I can't go any closer to the sun right now.

CAPCOM Okay, you're looking at the sky again.

SHEPARD Okay, we're

MITCHELL Okay. There you go.

CAPCOM Beautiful.

SHEPARD Okay, we're at the time to deploy the MET, Ed, if you want to swing it on back around.

MITCHELL Okay.

MITCHELL Bruce, what was the zoom setting you wanted -

CAPCOM Okay, let's try it at about 45 there, we'd like to get the flag in at the right extremity and the plus Y, if we can, at the left extremity. Hold that. Fan left about 2 degrees. Left 2 degrees. Okay, Ed, - okay.

MITCHELL Is that okay?

CAPCOM Yeah, back it out about to 40 on the zoom. Okay that's good.

MITCHELL Okay. (garble).

SHEPARD Okay.

CAPCOM Okay, Al and Ed, if we could get you both in the field of view there for a minute, we've got a message for you.

SHEPARD Okay.

CAPCOM Okay, you're looking lovely troops. Why don't you take a pair and let me pass a message to you.

MITCHELL Okay.

SHEPARD Okay.

CAPCOM Okay. We were very pleased a few minutes ago to receive a phone call here in Mission Control from President Nixon. He asked me to extend to you and Stu

CAPCOM his best congratulations. He said, that like millions of people all over the world, He is an astronaut watcher at this time. The picture is coming in very well at the White House, he said. The President said he knew how many thousands of people had worked on this mission without whom men would not be walking safely on the moon. He asked that I wish the Apollo entire team well. The President said he was proud of you and proud of them. He sent you a wire just before the flight wishing you God speed and he wishes you well on your return flight. The President also asked me to invite you to the White House for dinner and to spend the week end at Camp David with your families after the mission is completed. Over.

SHEPARD That's fine, Deke. Thanks very much. And we appreciate those kind words.

MITCHELL Thank you, Deke, and convey our thanks to the President, please.

SLAYTON Roger. Will do. I don't think Stu got this, but we'll see that he gets it later.

SHEPARD Okay, Ready. Get the wheels first.

MITCHELL Hey. Okay.

PAO That was Deke Slayton -

MITCHELL 180 gear down and locked.

SHEPARD Both tires are inflated properly on the MET.

CAPCOM Roger. Out.

MITCHELL Wait a minute.

END OF TAPE

MITCHELL Okay.
SHEPARD Okay. Put it there.
MITCHELL Let's get that.
MITCHELL (Garble) still up there - there we go.
SHEPARD LMP with that district again.
MITCHELL Yep.
SHEPARD Hardly worth mentioning.
MITCHELL Agree.
SHEPARD Okay, Houston as you can see the (garble) is deployed properly.
CAPCOM Roger.
SHEPARD Looks like it - looks like it's in good shape.
MITCHELL Okay. I'll get a camera.
SHEPARD Okay, if you want to -
MITCHELL If you prefer here -
SHEPARD I'll move around to put the TV camera on the scientific equipment area.
CAPCOM Antares, Houston. We'd like to get an EMU status report at this point.
SHEPARD Okay CDR is 3.7 and reading 72, no flags, I'm on low flow and I'm in good shape.
CAPCOM Roger.
PAO The matter pull card has been deployed now.
MITCHELL .7 and reading 67 percent low flow, low cooling and feeling great.
CAPCOM Roger.
SHEPARD Tv camera - TV camera is covered and proceeding to the rear of the LM to observe the deployment of the ALSEP.
CAPCOM Roger.
PAO The camera being moved now to televise the ALSEP off loading.
SHEPARD Okay, Houston, the cover is coming off the lens now.
CAPCOM Roger, Al. I -
SHEPARD (Garble)
CAPCOM Al, are you all the way back at the 30 foot position there? 6 o'clock 30.
MITCHELL Looks good. It's about 30 right there I'd say.
CAPCOM Okay. Our picture is moving around a lot you're going to have to shut it down and let it stabilize before we can tell you anything.
SHEPARD It's a little hilly here.
CAPCOM Okay, what zoom are you in?
SHEPARD I'm trying to find a level spot, Bruce. We're in -
CAPCOM Roger.

MITCHELL We're on the side of the hill as you probably have heard and it may not stay, it may tip over.

CAPCOM Can you poke one of the legs into the surface there? That's a pretty clumsy tripod, I realize.

SHEPARD I'll tell you in just a moment.

PAO That reference was to the TV tripod.

MITCHELL Do you know, I think it will stay now?

CAPCOM Okay. What zoom are you on?

SHEPARD Okay, how's that.

CAPCOM We need to back off the zoom some.

SHEPARD Yeah, I think we'll have to.

CAPCOM Okay. Okay. (Garble)

MITCHELL Okay, Bruce can you see the bay?

CAPCOM I can see your hands very clearly. We seem to be close (garble). Okay, hold that zoom, Al.

END OF TAPE

CAPCOM Roger, looks good.
MITCHELL Okay?
CAPCOM Beautiful.
MITCHELL Okay, the door is open. Let's see, crew bay door is open. Pulled a little stiffer than I expected in one sixth-g.
MITCHELL Looking good though Ed, and you all are within nine minutes of the time line.
MITCHELL Okay, we'll pick it up here in a little while.
PAO That's Mitchell removing the scientific instruments, the ALSEP package.
PAO Now Al Shepard removing the second package.
MITCHELL Okay. Got it down.
SHEPARD Okay. (garbled) I'm going to move it over a little bit here.
MITCHELL It's almost as heavy as you are.
SHEPARD Look who's talking. Move over. Man. It's rough to find a level spot to put anything.
MITCHELL Okay, number two's coming out. Okay, can you get that by yourself?
SHEPARD Yes, I think so.
MITCHELL Sure. If it doesn't vibrate too much.
MITCHELL Okay, and it's on the surface. All this beautiful white paint is sure going to get filthy up here.
PAO One hour, 32 minutes since cabin depress.
MITCHELL I'm going to have to bend a little bit. I just can't bend down for that.
SHEPARD Okay.
MITCHELL And hand tool carrier is clear.
CAPCOM Roger.
PAO Mitchell is just taking the handtool carrier off now and placing it on the MET.
CAPCOM You never get -
MITCHELL Say again Houston.
CAPCOM Nothing Ed.

END OF TAPE

PAO We now show heart rates on Shepard between 70 and 80, on Mitchell between 80 and 90. We're at 1 hour 35 minutes.

MITCHELL You will fully expect to see (garble) running around to pick up the loose ends and thrown away parts.

SHEPARD (Garble)

MITCHELL Okay and then there's a pretty level place right there.

MITCHELL Oops. Excuse me.

MITCHELL Okay, I'm ready for the fuel cask.

CAPCOM Roger, Ed.

MITCHELL The atomic fuel carrier as you can undoubtedly see is on the MET. No problem.

CAPCOM Roger.

SHEPARD Okay, the temperature indicator is on the mask, show it has been no heat.

CAPCOM Roger.

MITCHELL And the cask is coming down.

CAPCOM Roger, Ed.

MITCHELL And it is down far enough I believe.

MITCHELL Okay, stand by one. That's the best place in the world to work. There we are. Okay if we can get the lid off of it.

PAO Shepard, Mitchell fueling the ALSEP electric generator now. 1 hour 38 minutes since cabin depress.

END OF TAPE

MITCHELL Attention. 431.
SHEPARD Cleared for it.
MITCHELL I think so.
SHEPARD Okay, down a little bit. Go a little to the right right there. There you go.
MITCHELL Okay, good. Houston the lid is off the nuclear fuel cask.
CAPCOM Roger. Report temp levels.
MITCHELL And I have none of them nope both temp indicators are in the black. May I take that got me in mid-shoulders. Okay, it's open. Okay, the cask's ready. Okay, the - all set. Okay.
SHEPARD Flight (garble) that we can get from here.
MITCHELL Okay.
SHEPARD Okay, looks good. Alright, the mortar looks good and ready to go.
MITCHELL Very good.
SHEPARD They're reading on that tube.
MITCHELL Yeah, in just a minute.
SHEPARD Okay.
SHEPARD Okay Houston, all the temperatures indicators are still white.
CAPCOM Roger Ed.
MITCHELL That's the noise.
MITCHELL Okay, the door is closed.
MITCHELL Okay Houston, we're cover the television (garble)

END OF TAPE

SHEPARD Okay, where do you think is a good spot for the ALSEP.

MITCHELL Oh boy, that's going to be tough, Al. I would just head out toward Dublet out there and let's look. It looks great toward Dublet.

SHEPARD I think that's the best way, aim for the center of Dublet. Aim for the -

MITCHELL Yeah, aim for the center of Dublet and let's go from there. However, I think maybe we better go a little further south or we're going to violate that DPI g constraint if we go too far north. How about towards the south edge of Dublet?

PAO The camera will be deployed west toward Dublet where the ALSEP or scientific package activity will be viewed.

MITCHELL Hey, why don't you point it at - point it at us and we'll just pick it up on the way out?

SHEPARD What's that?

MITCHELL You ought to point it at us and we'll pick it up on the way out.

SHEPARD Well, we're supposed to - okay right now. You can put it here and watch the MET deployment, if you like.

MITCHELL Okay.

SHEPARD Okay, Houston, we're about a 40-foot zoom now on the area of the MESA and the MET. How does that look?

SHEPARD Houston, are you with us?

CAPCOM Roger. Let's go to 50.

SHEPARD Okay. 50.

CAPCOM And come right about 3 degrees. Okay. Good.

SHEPARD Okay.

PAO This view showing loading more equipment on the MET.

SHEPARD Okay. Got the television camera there?

MITCHELL Yeah (garble).

SHEPARD Okay.

MITCHELL Hey, Bruce, As I mount these 70-millimeter cameras on the MET, I just flipped the little spring clip I just pick up the whole MET and drag it along.

CAPCOM Okay, we got that Ed.

MITCHELL I can't do that when they get a little more weight on there.

CAPCOM Be sure you get the large scoop on there replaced.

MITCHELL Yeah. Okay, Bruce, I've put on two Hasselblads, and I'm going ahead and get my 16 millimeter on and getting it out of my way right now.

CAPCOM Okay, Ed, two Hasselblads plus the 16 millimeter.

MITCHELL Right. Well, I have just started the TV bracket in and I'm getting ready to open SRC number 1.

CAPCOM Roger.

CAPCOM And, Al,

SHEPARD (garble) my television camera.

CAPCOM Roger.

MITCHELL Black and white TV cameras are in the (garble) truck.

CAPCOM Roger. With the white surface normal to the line of the front.

Mitchell (garble)

END OF TAPE

SHEPARD That's correct.
CAPCOM Roger.
SHEPARD Bon dimentions horizontal.
CAPCOM Roger. Magazine Charlie, I show you still have 3 minutes remaining.
SHEPARD Okay, we'll leave it on there then.
CAPCOM Roger.
MITCHELL Okay, SRC 1 is open. Okay. Oh damn, dropped the way bag.
SHEPARD Wait a minute.
MITCHELL I'll get it.
SHEPARD Ed, use tongs if you want to.
MITCHELL Okay, (garble) any dirtier than necessary.
MITCHELL Hell, I dropped both of them. (Garble)
SHEPARD Okay, put them in your pocket when you're through.
PAO Shepard, Mitchell now on the north side of the lunar module Antares. They will later move the MET, or pull cart and scientific equipment to the west. The camera will be repositioned following that movement. We show 1 hour 50 minutes since cabin depress.
SHEPARD Okay, Houston, magazine double dog and double easy going on the met.
CAPCOM Roger, Delta Delta and Echo Echo.
MITCHELL See if we can move you up a little.
SHEPARD Yea.
MITCHELL (Garble)
MITCHELL anyway your getting that ready let me slip these pigments in there.
SHEPARD Okay.
MITCHELL That's (garble) I kicked it.
MITCHELL Damn, these suits are hot. These suits are sure a lot stiffer than the training suits.
SHEPARD (Garble)
MITCHELL Yea.
MITCHELL Well now, there it goes again.
SHEPARD I should have lifted it up and put it over you and put it down.
MITCHELL Lift it up and do what?
SHEPARD Lift it up with one hand and put it over the other.
MITCHELL That's what I was going to do, this time.
PAO Shepard Mitchell still loading the MET, long list of equipment to be loaded.

END OF TAPE

MITCHELL Okay. It's a bit rougher than expected.

SHEPARD Okay Houston, I've got three core tubes, no tabs.

CAPCOM Roger.

SHEPARD Houston, I finally succeeded in getting two weight bags.

MITCHELL One SESC in so far. In addition to other things plus the core tube cap assembly.

CAPCOM Roger.

SHEPARD Okay, you got the other SESC.

MITCHELL I've got the other SESC now.

SHEPARD Okay, very good.

MITCHELL The problem here is the type that takes a monumental amount of force to get in there.

PAO When they start to move, Shepard will pull the MET, Mitchell will carry the ALSEP package.

MITCHELL And Houston, I've a feeling you're getting samples at this point.

CAPCOM Roger.

SHEPARD Okay, and we'll put this one in the pocket. (garbled).

PAO Mitchell will be carrying the ALSEP barbell style, with the antenna mast serving as a carrying bar.

SHEPARD Okay Houston, I have close up camera.

CAPCOM Roger, still reading on even hundreds.

MITCHELL I'm not there yet.

CAPCOM Okay.

MITCHELL Didn't want that to get away from me, but it did. Got it. Okay, Houston, it's turned on and it's reading 300.

CAPCOM Roger.

SHEPARD Okay, can you see that little flag, Ed? Ed, can you see that little flag alright?

MITCHELL Yep, I think I can see that. Good show.

MITCHELL Okay, and here's one hammer for you.

SHEPARD Hey, a gift -

END OF TAPE

SHEPARD Okay, thank you.
MITCHELL Okay, we finally got to set the flight MIL marks.
CAPCOM 21 Nancy.
SHEPARD Okay, glad your still with us Bruce. Okay, Break there.
PAO The crew will shortly be moving to their new position.
SHEAPRD Okay, lets put this baby over here. Put your left arm.
MITCHELL Let me double check. Let's see 1 2 3.
SHEPARD Okay, Houston, we'll start the run down here, I think we are about ready.
CAPCOM Yea.
SHEPARD It's a core tube cap assembly. Extension handle this does it, two sets of tongs. We have a number of geophones anchored on the front. We have tether, the gnomon, the hammer, the scoop. 3 core tubes 35 vacuum Spencer close up camera, Dual CFC's, 2 70 MM cameras with solar exterior. 1 16 mm camera and 1 magazine, 4 way drag, 2 amps, extra number of geophone flag, large scoop is on right, large scoop is on and we're taking the trenching tool with us.
capcom Okay, and you should have 16 mm and 2 mags.
SHEPARD That correct, we have a total of, I was going to say a total of 3 mags, 1 is almost used and the other 2 are clean.
CAPCOM Roger, looks good.
SHEPARD We're lucky.
PAO At 2 hours the crew is ready to move.
CAPCOM Let us check before you set out.
MITCHELL Okay, the LMP is reading 3.75 about 55 per cent, medium to low, low cooling. Doing great.
CAPCOM Okay, say again the percentage Ed.
MITCHELL It looks like I'm reading 50 now, sorry about that. Man it's hard to see.
SHEPARD Yea.
MITCHELL I'm reading 55 per cent Bruce.
CAPCOM Roger.
SHEPARD I should be reading lower than that. It's a mystery.
MITCHELL No, I'm not reading more than that.
CAPCOM Go ahead, Al.
SHEPARD Okay great.
MITCHELL Okay Al, there's a 3.75 reading 62 per cent, and I have no flags on, I'm on vent cooling and I'm quite comfortable.
CAPCOM Roger out. And we need to point the TV camera out to the ALSEP side.

MITCHELL Al, I'll go get it.

SHEPARD Let me zoom on out and get that. I think I'll aim it a little bit to the left of the, that bright crater on the side of the west wall. I'll double it.

MITCHELL Hey, that's a good place.

CAPCOM Say Al, are there any uncertainties as to the deployment area that we would rather go to a zoom of 100 instead of a 150, but if you think you've got a good site picked out now, well we can go to 150.

SHEPARD I think we can find a good site. We maybe a little closer to Doublet than the map shows because of the grade going up there, but I think there's a level site fairly close to the south rim of Doublet and we'll aim the camera in that general direction and give you 100.

END OF TAPE

SHEPARD Very close to the south rim of Doublet. I'm going to go in that general direction and give you 150 mils.

CAPCOM Roger, Al.

SHEPARD (garble) Okay. You should be able to see on the right side of your picture as I settle down here. You should be able to - hold on.

MITCHELL Al, you can get quite a way further out if you want, it's got a little cable left.

SHEPARD You should be able to aim right for the south rim of Doublet now. South rim above Doublet, but you'll probably be able to see a bright star crater right on the very edge of your field of view. The F-stop okay?

CAPCOM Yeah, F-stop fine. I've got what looks like one, two ridges and then the horizon in the picture and I see a - just past the second ridge I see it looks like two craters in line. Over.

SHEPARD Maybe two small boulders.

CAPCOM Okay, maybe.

PAO Camera pointing where the ALSEP will be deployed now.

MITCHELL It's out there at 6 mils.

SHEPARD Okay, I'll go pick up the barbell.

MITCHELL Alright (garble) on the footsteps.

CAPCOM Al, this is Houston. We'd like to try F22 and peak.

SHEPARD Okay, you've got me just in time.

SHEPARD Okay, F22 and peak. How does that look to you?

CAPCOM Roger Al, and we'd like to elevate a little bit so we get the horizon in.

SHEPARD Okay, we'll do it. How's that?

CAPCOM See if you can depress a little now. It's a real touchy at this long focal line.

SHEPARD Okay, we'll try and depress a little bit. Okay, you still have the horizon?

CAPCOM Okay, that looks good for elevation and if you've got us aimed at your proposed deployment site, we're go.

SHEPARD Well, it looks like that's the way we're going.

CAPCOM Okay, very good.

SHEPARD You'll just have to stay in that line of sight, Bruce.

CAPCOM Roger. You want a DC8?

SHEPARD Yep. I think -

CAPCOM Well our ASR isn't working very well but we want to get you in the field of view we'll acquire you.

MITCHELL Roger, I'm headed over that way.

END OF TAPE

MITCHELL Field of view to you yet, Bruce?

CAPCOM Negative, Ed. I believe you're off to our left. Okay, you're coming in now.

MITCHELL - field of view until we get up pretty close to the site.

CAPCOM You're coming in now.

MITCHELL Okay. Okay. I'm going to stop here and rest for a minute, Al. This darn thing is heavier than I expected.

CAPCOM Okay, Ed, we've got you in the field of view over to the left, now.

MITCHELL Okay. Al should be coming in right now, too.

SHEPARD Looks as if it might be a little secondary impact right here by me.

MITCHELL Well, there's so many different types of craters around here, you could - we could spend the whole EVA within a hundred yards of the LM. Okay, lead on and I'll follow and watch the MET for you.

SHEPARD Okay. Going to your right.

SHEPARD Okay, Houston. We're proceeding over a very fine grade regolith we described before. Undulating surface.

CAPCOM Okay. You need to angle left just a little bit.

SHEPARD Getting more sloped.

SHEPARD Left?

CAPCOM Yeah, you're doing fine now.

SHEPARD Okay.

MITCHELL Say, Houston, this looks like brown copper powder, it's so fine in most places.

CAPCOM Roger. The MET's going off to the right.

SHEPARD (garble) is increasing now. The MET's trying to find a smooth place to go.

MITCHELL Al, I think we'll have to go around this crater, here, to the left. I think we can find our way down. Good heavens, that's a deep hole, but I guess we can make it either way.

SHEPARD Say again.

MITCHELL I said we could make it either way.

SHEPARD Okay.

MITCHELL See those two over there at 10 o'clock, Al, we can see those there on the map.

SHEPARD The two at 10 o'clock.

MITCHELL Yeah.

SHEPARD Yeah. Okay, Houston. We'll be dropping down out of sight for a while probably.

CAPCOM Roger.

SHEPARD Going down in a depression.

MITCHELL A deep. A very deep depression, compared to what they looked like.

SHEPARD Well, I don't know.

MITCHELL I don't know either. Let's stop a minute, Al.

SHEPARD I'm not sure but what we've picked just about as good a spot as anywhere.

MITCHELL I think so.

SHEPARD It looked a little further out here because of being closer to zero phase track.

MITCHELL I think that's it, but it's not a bit smoother than the other.

MITCHELL I'll be darned if I know what to do.

SHEPARD Well, we'll move on a little closer to Doublet.

MITCHELL Okay.

PAO The crew pausing here for a rest.

MITCHELL Okay.

END OF TAPE

MITCHELL Well, I think the first ridge over there, about another 75 yards, might be our answer. Right beyond these vector craters.

SHEPARD Yeah, I think so. It's probably a pretty good spot.

SHEPARD Buzz right up there.

MITCHELL Yeah.

SHEPARD Okay, Houston. We're in the general area of the planned ALSEP deployment now, on the check, it's in a depression and I think we'll move on a little closer to the Doublet to give it a higher elevation.

CAPCOM Roger you're visible from oh, about the armpits up right now.

MITCHELL Okay.

SHEPARD Think we'll bear a little to the left now.

MITCHELL I guess we'll have to.

SHEPARD Nothing like being up to your armpits in lunar dust.

MITCHELL I think just to the left of that rock that's ahead of us, it's about a path through here.

SHEPARD The MET seems to be riding very well, Houston. Ed's bouncing a little bit making time ERTS but AOT about to turn over.

MITCHELL It jumps about a foot every time it hits a small rise but very stable.

CAPCOM Are you getting any dust thrown up by the tires.

MITCHELL Nope. There is a little bit, Bruce, but it's not - the dirt feels to be kind of clumpy.

SHEPARD Okay, I guess that ridge is the best place.

MITCHELL I think so.

SHEPARD How are you doing?

MITCHELL Fine.

SHEPARD Did they show all your television, Bruce?

CAPCOM Yes, indeed. You're very well centered.

SHEPARD He's coming back in now, we're coming up to the (garble) here.

CAPCOM Roger, I can see your shadows now so I guess, I can see your feet so you are well in view.

MITCHELL Okay, about another 30 or 40 feet there and I think is as good as we're going to get.

SHEPARD Yep.

SHEPARD What we're discussing here, Houston, is the braid coming up to belt doublet is very consistent and it's difficult to find a level place.

MITCHELL Okay. Let's set it down and look for a minute, Al.

SHEPARD All righty.

MITCHELL Then we can figure where we are.

MITCHELL I don't know but what this rise we're standing on right here is about as good as any. Okay, now there's a 20 meter crater there.

SHEPARD Okay. Pick up the - does that have a map on there, too?

MITCHELL Yeah, it's in the bucket.

SHEPARD Now, let's see.

MITCHELL Okay, the one - that one right there.

MITCHELL Let's see if we can find those. The big one. (Garble) can we spot that one and those two.

SHEPARD That one right over there. I believe it's an old rounder one right there.

MITCHELL (Garble)

SHEPARD Yeah, that may be.

MITCHELL What's this one right here?

MITCHELL That one right beside it. Oh, I don't know whether we're that far out or not, Al.

END OF TAPE

PAO Stu aboard Kitty Hawk reported visual sighting of Antares at a GET of 114 hours 48 minutes.

MITCHELL (Garble)

PAO This sighting occurred while in program 24, a computer program for landmark tracking. We're at 116 hours 37 minutes. 2 hours 18 minutes since cabin depress.

MITCHELL I'd say we're probably about 400 feet out almost directly out in front.

SHEPARD 4X

MITCHELL Okay.

SHEPARD T.V. is on normal track.

MITCHELL Look here. See that crater in -- right in between those two traverse tracks.

SHEPARD Yeah.

MITCHELL Is it those two craters or the crater that you pointed out.

SHEPARD Yes.

MITCHELL Okay, I think that one between the traverse tracks is that one right there. And that here is right over there, and the one you pointed out, this one? Is that one over there, the big one behind it, I think it's out of sight, unless it's that one over there.

SHEPARD Well, where do you think we are?

MITCHELL I think that we are to the north - I think we're about BR and let's see we (garbled). But that's CQ.8 and 62.5. 61.5. Do you read that Houston?

CAPCOM Roger, Charlie came back 8 at 61.5.

MITCHELL Okay, that big rock up there, about half way between here and there. (garbled) lighter in there.

SHEPARD Yeah.

MITCHELL That leaves the clear area down here without a number. Okay, let's put it right up in there.

SHEPARD Right up there, on that spot.

MITCHELL Yep, you got it.

SHEPARD Okay Houston, we're going to move about ten meters to the west. Northwest from those coordinates that Ed gave you. (Garble)

CAPCOM Roger.

MITCHELL ALSEP central station is go. We reserve the right to change our mind as to where we are after we're on the hilltop.

CAPCOM Okay.

SHEPARD Okay.

MITCHELL Pull over to the right, there's a crater there.

SHEPARD Well, that's about where we are.

CAPCOM Okay, we've lost the mat off to the right of our picture.

MITCHELL What's wrong with right about - it would just be a nice clear shot down there with the bumper.

SHEPARD Can you still see ED, Houston?

CAPCOM Yeah, he's at the extreme right hand edge of our picture Al, and you're off.

SHEPARD Okay, we'll turn back on this is (garble) deployed.

CAPCOM I guess the primary consideration is of course is the fact to find a good site and being able to watch you secondary.

SHEPARD Yes, we understand, but it's all pretty much the same, the up slope is about oh - four or five degrees. Pock marked by all types of craters. They're all old craters, but none the less still produce a very uneven surface. And I think we've found a spot here as reasonable as you'll find anywhere.

CAPCOM Roger, Al.

MITCHELL Let's see. Al, but those two craters right there are going to be in the way. I think I'd like to move back here about five feet. Better than to run through those going south. Or I can leave a central station about where I've got it, I mean the power generator, think that'll be alright?

SHEPARD Are you done with your geophone line?

MITCHELL Yes, I'm through.

SHEPARD Why not put Hus on your craters, I'll give you a good reference.

MITCHELL Well, I'm going to have to go this way so if I can't find that ridge I've got to put it more north. Put it that way.

END OF TAPE

MITCHELL We go this way so as that I can't fire into the ridge, I've got to put it more north, right up that way. I'm going to go right down and go through there. Okay, this looks good to me if you're happy with it.

SHEPARD Let's see. Southwest is the best spot is right through those two craters.

MITCHELL (Garble) Almost due south of the (garble).

SHEPARD (Garble)

MITCHELL I'm going to have to go due south.

SHEPARD Okay, you can go by the right edge of that baby.

MITCHELL (Garble)

SHEPARD Okay, very good.

SHEPARD Okay, we've got a spot Houston, we will proceed with the deployment.

MITCHELL We're not quite as far from those coordinates as we thought we were.

CAPCOM Roger Antares.

SHEPARD Okay Houston, we will start the 16 mm going here and -

CAPCOM Okay, give me a hack.

SHEPARD We may have some to change the magazine.

CAPCOM Roger, I'll keep track.

SHEPARD I'll give you the hack.

CAPCOM And if you have a free minute, we would like some commentary on the depth of the MET tracks.

MITCHELL Al, the man, we're going to take a picture of for it after so we can see the MET track clear back to the LEM. Thery are about three quarters of a inch deep.

CAPCOM Roger.

PAO From the crews report on grit coordinates, they are perhaps 600 feet from the lunar module Antares.

SHEPARD We can't get any closer to REM or that crater, Ed.

MITCHELL It's fine with me, Al.

SHEPARD Okay.

MITCHELL SDS, 6 frames per second.

MITCHELL I can see that this is going to be a considerably slower process then I expected.

CAPCOM Has he started you yet, Al?

SHEPARD Stand by.

SHEPARD That was right, 6 frames per second.

CAPCOM Roger.

PAO Shepard has just turned on the 16 millimeter camera.

CAPCOM And for reference, Al and Ed, you're about 29 minutes behind the timeline at this point. Over.

MITCHELL Okay.

SHEPARD Okay, Ed is working on the central station and I'm going over for the subpallet, Houston, the RTG cable temperature is 175 degrees.

CAPCOM Roger. Out.

END OF TAPE

PAO Apollo Control, Houston, 2 hours 28 minutes now since cabin depress. Shepard and Mitchell will deploy the experiments before powering up the central station.

SHEPARD Okay, some power is deployed northeast of the central station.

CAPCOM Roger, Al.

MITCHELL Houston, the current - current reading is 8 -

CAPCOM Understand 8 amperes before pressing the switch.

MITCHELL That's affirmative.

CAPCOM Roger.

SHEPARD Ed, that looks beautiful. Beautiful. But all full of dust, Ed.

MITCHELL That's nothing. Everything else is going to be full of dust before long. (garble)

SHEPARD Okay. I'm going to have to lift this up. You want to help me?

MITCHELL Okay. What you want to do?

SHEPARD I'm going to have to lift it up and shake the dust out of that (garble). I can't get it otherwise.

MITCHELL Okay.

MITCHELL Okay. Watch it.

SHEPARD (Garble) There we go. Okay, watch that -

MITCHELL Is there anything that's not tied on.

SHEPARD That's these here. I've already taken those out.

MITCHELL Okay, I'll hold it.

SHEPARD Ed, Will you turn it upside down and shake it.

MITCHELL Every little (garble) bolts falling off.

SHEPARD Yeah, but they're not the one we've got the problems with. Okay, plop it over on mine.

MITCHELL That'll do it?

SHEPARD No, it's still not clear. Clear.

MITCHELL Okay, I believe that will get it.

SHEPARD Okay.

MITCHELL I need your (garble) right here.

SHEPARD Okay, I'll hold it. Go ahead.

SHEPARD Okay.

MITCHELL Got it?

SHEPARD Yes. We need to get the other one.

PAO Apollo Control, Houston. Heart readings on - heart rate readings on Al Shepard have ranged between 90 and 100, on Ed Mitchell between 100 and 120. The higher reading on Mitchell probably because he carried the ALSEP package.

MITCHELL - - tilt it down a little more - let me hold it and you go ahead - -

SHEPARD That's it, Ed. Turn it around and get the center of the picture.

(garble)

MITCHELL Okay. I got it.

MITCHELL You better hold - there you are - oops. Don't step on that.

SHEPARD Just put it down here. I guess it's a good place. Let me cross one.

MITCHELL Don't step on the PSE cable there.

SHEPARD No. Let it go.

END OF TAPE

MITCHELL That's it, isn't it?
SHEPARD No it's not at you, it's near me.
MITCHELL May be your tool is screwed up - let's see if mines any better.
SHEPARD Pull a turn.
MITCHELL It ain't no better (garble).
SHEPARD Let's step on it (garble).
MITCHELL We're not even sure there's one down there.
SHEPARD Well, there should be.
CAPCOM Apollo has LOS CSM.
MITCHELL Thank you Al.
CAPCOM LOS, CSM available to COMMAND.
MITCHELL Okay, here's everything we've got at this point. Just lift it, I'll get it.
SHEPARD (Garble) Hold still.
MITCHELL The cover off.
MITCHELL There.
SHEPARD There. Yeah, it's there. See it.
MITCHELL I can't see it there - if you think it's there, go get it.
CAPCOM Al, this is Houston. Could you give us some more details of your problems at the side from the sub pallet you're working on.
SHEPARD It's a side Boyd bolt that sits back in the corner. It apparently got full of dirt Bruce, and we're having a devil of a time getting it off.
CAPCOM Roger.
MITCHELL The one that's deep in the back. You can't feel it any longer.
CAPCOM Roger.
SHEPARD Hold that circular level - oh, good.
MITCHELL What I want to do is get the sun shadow in there. And you had it for a minute. No -
SHEPARD Tilt it a little more this way.
CAPCOM (Garble) You're go for COMMAND. CSM.
KITTY HAWK Right (garble).
MITCHELL Okay. Can you just hold it right there.
SHEPARD Okay. I'll try.

END OF TAPE

MITCHELL See where it's not.

PAO The white spot in the center of the screen is most probably a reflection off the net or the pull cart since this is normally where it would be parked for this activity.

SHEPARD What do you want?

MITCHELL (Garble) Yes, over there it is.

MITCHELL Okay, got it.

SHEPARD Got it? Great. Okay.

MITCHELL Figure we got it fixed.

SHEPARD (garble)

MITCHELL (garble)

CAPCOM Did you get it loose, Ed?

MITCHELL The cap is loose, yeah, we've got it. Okay, let me move it up. Are you ready to go?

SHEPARD Yea. I'm ready to get the connector.

SHEPARD Come on.

MITCHELL We've got it.

SHEPARD Okay, and here comes the side (garble)

MITCHELL Okay, let me get the connector.

PAO That's the superthermal ion detector Shepard having a little difficulty getting one of the fasteners off, but this has been accomplished and pressing on.

SHEPARD (Inaudible)

CAPCOM (Inaudible)

CAPCOM Ed, this is Houston.

MITCHELL Go ahead.

CAPCOM Roger, 16 millimeter has been running about 9 minutes now since it ran out of film we're using juice from the battery, and also we'd like to get the MET turned a few degrees, you've got a specular reflection coming right back to the TV camera, over.

MITCHELL Okay, we'll do that right now, Bruce.

CAPCOM Okay.

SHEPARD (Inaudible)

MITCHELL Singing. Alright connector connected. Am I clear to press the shorting switch, Bruce?

CAPCOM Roger, go Ed.

MITCHELL Adjoining switch is depressed. You'll be able to read it in a minute I think.

CAPCOM Yes indeed. That's much better.

MITCHELL Okay.

PAO Mitchell getting ready to deploy the GFO line, which is a part of the acting seismic experiment.

SHEPARD (garble) charlie charlie is off.

END OF TAPE

PAO Meanwhile Al Shepard starting to deploy the passive seismeter.

MITCHELL How long do you estimate it's going to take?

SHEPARD ECHO, ECHO will be going on.

CAPCOM Roger. Esmerelda Equador.

MITCHELL He's got a check list beside him to cut those, Al. There's no way you can beat him at that game.

CAPCOM You'd better believe it.

SHEPARD What have we done to deserve this?

SHEPARD What have we done to deserve this?

CAPCOM Just wait till you get to JJ.

MITCHELL I'm nervous already.

SHEPARD Okay, FA, 6 frames per second 2/50

CAPCOM Roger. Give me a hack when you're started.

SHEPARD Okay, Bruce. Am I? Hack, Hack.

CAPCOM Roger.

PAO Shepard starting the movie camera.

MITCHELL The switch number 5 is clockwise.

CAPCOM Roger, Ed.

MITCHELL There's the separate geophones coming off now.

CAPCOM Roger.

SHEPARD Hey, got pretty good range out of that -

MITCHELL Man, that thing really went didn't it?

SHEPARD Pretty good range out of that baby.

PAO Mitchell will start deploying the thumper geophone cable to the southeast which should run off the bottom edge of our picture. The thumper geophone cable about 300 feet long.

CAPCOM Al, this is Houston. Could you tell us where you are in the SIDE or PSE sequence?

SHEPARD Yes sir. The legs and the SIDE have been deployed, PSE stool is being placed 10 feet north from the central station.

CAPCOM Roger.

PAO Ed Mitchell will move out about 10 feet and stick what is known as an anchor in the cable to assure himself that he does not pull the ALSEP package. 117 hours 7 minutes -

MITCHELL Thumper is stored on the MET. I had to get the first geophone out in order to get it there, but we'll take care of that in a few minutes.

CAPCOM Roger, Ed.

MITCHELL Now comes the task that tries mens patience. Getting the mortor pack off. And it's coming off now. Incidentally, how much are you able to see, Bruce?

CAPCOM Okay, Ed. You're about 1/7 the height of our picture.

MITCHELL Yes. Okay. (garble)

END OF TAPE

SHEPARD (Inaudible)

MITCHELL Okay, it's going to be -

MITCHELL Okay, Bruce, the mortar pack is in place.

CAPCOM Roger.

PAO Mitchell reports the mortar package in place. It's part of the active seismic experiment.

SHEPARD Of the PSE.

CAPCOM Roger, Al.

PAO Shepard reports passive seismometer deployed.

MITCHELL You know I don't think the solar wind is going to blow our antenna like it generally does.

SHEPARD How about that.

MITCHELL Steady as a rock.

MITCHELL Okay, the CPLEE starting to come off now.

SHEPARD Watch it, watch it, watch it.

MITCHELL Yep, thank you, thank you, thank you.

SHEPARD And let's try to get it back in line. Can you tap it for me a little. We're a little too close, if we can get this whole thing a little further away. Can you push it with your foot.

MITCHELL I don't want to get too much dust on it. It's bad enough as it is.

PAO The joking reference to the solar wind -

MITCHELL (garble). That looks pretty good.

SHEPARD Is it pretty level?

MITCHELL It looks pretty level to me, Al. Okay CPLEE is coming off.

SHEPARD No, it's not.

PAO The joking reference to the solar wind harkens back to field trips.

SHEPARD Okay Houston, Al is reading 3.75, reading 55 on the 02. I have no flags, on my minimum cooling and very comfortable.

CAPCOM Roger, Al.

END OF TAPE

CAPCOM - - go ahead, Ed.

MITCHELL Okay. Hold on here. Okay. Ed is reading 375 - is reading 43 percent, and is reading has no flags is on minimum cooling and feeling very comfortable.

CAPCOM Roger, Ed. And for your information Antares, those numbers compare very well with our pedictions, and it looks like you're going right down the old line.

MITCHELL Very good.

CAPCOM And just by way of reference I show you about 38 minutes behind the nominal time line at this point.

MITCHELL Okay.

SHEPARD Okay. We'll give you a little credit for that, Bruce. Better make up your mind as a television technician.

CAPCOM Roger. And we're looking right now at about a 30 minute extention. I'll have more word for you on that later.

MITCHELL Okay. We'll keep looking ahead, here.

MITCHELL Okay. (garble) certain amount of dirt. Metro station is level.

MITCHELL Okay, Houston. The CPLEE is deployed. It is - the ball is in the inter ring. And it is lined up due East.

CAPCOM Roger, Ed.

PAO Shepard reporting the Charge Particle Experiment deployed. Mitchell -

MITCHELL (garble) that little CPLEE sitting there. It won't long.

SHEPARD All trim and proper.

MITCHELL You look very white, trim and proper yourself. Little tarnished, now, but since there lower extremeties, huh?

CAPCOM (garble) Houston. You confirm interium or initial mortar pact deployment.

MITCHELL That's affirmative. I confirm it.

CAPCOM Roger.

MITCHELL It's lined up almost due north, Bruce, in order to have a free flight away from all the craters that I can see and still miss the ridge they were worried about.

CAPCOM Roger. We copy.

MITCHELL And I'm heading out with the SIDE and the CCIG at this point.

CAPCOM Roger.

MITCHELL Say, Houston, relative to the CCIG since we have these ridges to the south of us and this thing is being deployed somewhat in a hollow, is this going to upset the investigators?

CAPCOM Stand by. I'll get you an answer on that.

MITCHELL I don't really know what else we can do since this whole area is a bowl.

CAPCOM Ed, you can go ahead and deploy in accordance with the nominal plans that we understand and that will not impact the experiment.

CAPCOM Ed, Houston. Do you copy deploy in accordance with the nominal plans?

MITCHELL Okay. Got you, Bruce. Thank you.

CAPCOM Roger.

MITCHELL Sorry. I was busy at that moment.

END OF TAPE

SHEPARD Okay, Houston. To keep you honest. Al is operating in the central station at the moment.

CAPCOM Roger, honest Al.

SHEPARD (laughter)

PAO Mitchell now deploying the lunar atmosphere detector to see if they can detect any atmosphere - lunar atmosphere, including gases from transient events. We're coming up now on 3 hours since cabin depress.

SHEPARD Okay, up comes the central station. And that's one for the troupes on the ground.

CAPCOM Okay, we're watching.

SHEPARD Can you actually see it from there?

CAPCOM I couldn't see it move up. I can see something, so to speak, flopping in the breeze, I guess that's the foil.

SHEPARD Flapping in the what?

MITCHELL Houston, I'm having a wressling match with the side of the CCIG. The side is so light, the cable is sufficiently stiff that every time I touch the CCIG it almost turns the side over. It's turned it over twice on me now.

SHEPARD Want some help up there, Ed?

MITCHELL I better do it that way I think.

CAPCOM Say again on that, Ed.

MITCHELL Say again?

CAPCOM Yes, I missed your last.

MITCHELL I said I've been wrestling with the sides of CCIG here. And the cable is still sufficiently stiff and the side is sufficiently light. That's suffiently, a little bad, but it keeps getting tipped over.

CAPCOM Can you do anything by moving it back a little bit toward the central station to slack off the cable?

END OF TAPE

SHEPARD - cable.

MITCHELL No, no, no, no. It's the cable from the CCIG to the SIDE.

SHEPARD Oh. Okay.

PAO The SIDE is a super thermal ion detection experiment.

MITCHELL I see it. Okay, Houston. I think I have it leveled. Except that it's fully balanced - it turns out. It wants to tip over very easily to the rear. The CCIG is aligned and leveled. I mean the SIDE is aligned and leveled and the corners, I guess I better check those.

CAPCOM Okay, Ed. If you have a problem, SIDE is first priority, CCIG comes second.

MITCHELL Rog.

MITCHELL It's interesting Bruce that the dynamics of the SIDE are such that just pulling this pin on it almost tipped it over again but I had to use a lever technique to get it off.

CAPCOM Roger.

MITCHELL The SIDE is deployed.

CAPCOM Roger and copy the dust cover is off.

MITCHELL Okay. We'll head back and get started on the thumper geophone.

CAPCOM Okay. What's the status of the CCIG, Ed?

MITCHELL It's in good shape. It's deployed about four feet to the southeast and pointing almost due south with a little bit to the west.

CAPCOM Beautiful.

PAO Shepard has raised the frame of the central station. The reflection you see is from the aluminnum foil surrounding it.

CAPCOM This is Houston. I show about 3 - 4 minutes overdue on the magazine on the 16 millimeter camera.

MITCHELL I was heading for it over there now, Al, I'll turn it off.

SHEPARD Okay. You shut it off and we'll change to mag here.

MITCHELL Okay. And Bruce I'm going to go to intermediate cooling just for a few minutes - for a couple of minutes.

CAPCOM Roger, Ed.

MITCHELL I've got it in between LOW and INTERMEDIATE now.

CAPCOM Roger, Ed.

MITCHELL And I'm going to take penetrometer measurement now, Houston.

CAPCOM Roger.

MITCHELL As I get ready for the thumper.

MITCHELL That new extension handle works well. Hey, Houston. I'm taking these measurements now at a site about 15 - about 25 feet south of the central - not of the central station but of the RTG and here goes my first one. One hand.

PAO Mitchell's sticking a rod in the ground to test bearing strength.

MITCHELL Well, let's see - it's not nearly all the way in.

SHEPARD Six marks. Six blacks showing.

MITCHELL Pick 1, 2, 3 - 1, 2, 3 a double one and a black and a white. A white, a black and white below the upper double one. Do you understand?

CAPCOM Roger, we do.

END OF TAPE

MITCHELL This is one hand. With two hands, I can push it all the way in.

CAPCOM Roger.

MITCHELL No chart what so -

SHEPARD You have about three inches left there.

MITCHELL Well, there was no problem getting it in, Al. that's my things won't reach any further.

SHEPARD Okay.

MITCHELL Here we go, one hand. And I have two white and two black rings going below the upper double ring. Understand?

CAPCOM Roger, understand.

MITCHELL Put one hand, and two hands all the way again.

CAPCOM Roger, Ed.

MITCHELL And one more.

MITCHELL And this time, Houston, I got it all the way to the upper double ring with one hand.

CAPCOM Roger, Ed. And get all -

MITCHELL And again all the way in two hands.

CAPCOM Okay, the geophone deployment.

MITCHELL Rog. And Houston, I'm back in minimum cooling.

CAPCOM Roger, Ed.

PAO Kitty Hawk overhead is scheduled for a plane change at 118 hours 9 minutes 35 seconds ground elapsed time.

MITCHELL That looks like a pretty good line right out there.

CAPCOM Honest Al, this is Houston. How are you doing?

SHEPARD Fine, thank you, Honest Abe. I'm in the process of leveling and alining the antenna.

CAPCOM Roger.

PAO Shepard now alining the central station antenna.

MITCHELL Now, let's see what that side looks like. Okay, the antenna is leveled. Al, you do take a picture down along this line, do you not?

SHEPARD Yep. Okay.

MITCHELL Done got me a site.

END OF TAPE

PAO 3 hours 13 minutes.

MITCHELL I have my first geophone in the ground, and in this soft ground they go in vertically without any problem and they push right on in.

CAPCOM Okay, that's the 10 foot one.

MITCHELL That's affirm.

CAPCOM Rog.

MITCHELL Okay Houston. The central station antenna is aligned. I'm going to turn switch number 1 clockwise, and switch number 5 counter clockwise. Are you with me?

CAPCOM I'm with you, go.

PAO Mitchell has deployed the first of 3 geophones.

MITCHELL Okay Al, will you watch me, keep me honest here.

SHEPARD That's for sure, Ed.

MITCHELL Number 1, clockwise. Number 5, counter clockwise.

SHEPARD (garble)

CAPCOM Roger, out.

MITCHELL Kind of start moving on Al.

SHEPARD Al, for your information they're receiving a good signal back from ALSEP.

SHEPARD Okay.

MITCHELL See where my first geophone is Al. Is it okay?

SHEPARD Yea, I'll just - I'll be up there in just a sec. Okay, a good line for you is the horrizon intersection of that. Turn your rev, it's out of your sight, do you see it? That big intersection there, okay, that's the (garble).

MITCHELL Beautiful.

MITCHEL Okay, Houston the ALSEP anterior alignment looks good.

CAPCOM Roger out.

MITCHELL Okay, let's press on with the LRQ.

CAPCOM Okay, we've also got the PSC final deployment.

MITCHELL Okay, and we'll do that now.

SHEPARD Singing. Okay, Ed.

PAO Shepard deploying the lazer deflector now.

SHEPARD Blocked.

PAO 3 hours 16 minutes since cabin depress.

END OF TAPE

PAO heart rate readings on Shepard now show him ranging in the 70s, Ed Mitchell ranging in the 90s. We're at 117 hours 37 minutes ground elapsed time. 3 hours 18 minutes since cabin depress.

MITCHELL Okay, Houston. The second geophone is in. I was a little bit overly optimistic about the ease of which they could be put in. The tension of the cable is such that it won't allow the geophone to hang straight. There's a set in the cable.

CAPCOM Roger, Ed.

MITCHELL The geophone isn't heavy enough to straighten it out. But we got it in.

CAPCOM This we stuff?

MITCHELL That's an editorial we.

CAPCOM Roger. And are you getting a -

MITCHELL I was really referring to the end of the -

CAPCOM Are you getting the second flag in there?

MITCHELL I was really referring to the end of the thumper and me.

MITCHELL Yes, it's in.

SHEPARD Okay, the final deployment of the PSE gives us a shadow reading of 093.

CAPCOM Roger. 093 degrees and level. Over.

PAO The second of three geo -

SHEPARD Straight and level.

CAPCOM Beautiful.

SHEPARD Make that -

PAO The second of three geophones deployed 150 feet from the first.

SHEPARD You can call it 093.5 if you want, Houston.

CAPCOM Roger, out.

MITCHELL And the skirt is all deployed very nicely and level and flat all the way around.

PAO Shepard reporting completing of the passive seismometer deployment.

END OF TAPE

MITCHELL Okay, Houston, this is Ed. I'm at the end of my geophone line. Looking back over it, I see the cable has knocked down the second flag. Do you want me to go back and look at it or shall we try one shot and see if everything is working?

CAPCOM We'd just as soon go ahead and try a shot and see how it works, Ed. Have you got the third one in the ground, yet?

MITCHELL Yes, the third one is in the ground. Somehow or another I'm tangled up on this cable. Just a minute.

CAPCOM Roger.

MITCHELL There we go.

SHEPARD Okay. The LRQ is deployed 100 feet, west of the central station. It is level, LR3 index is 0. The cover is coming off now.

CAPCOM Roger, Al.

CAPCOM And Ed, this is Houston. Whenever you're ready we need to get a calibration on the geophone, so if you and Al will just stand still for a moment then we can give you a go to commence thumping.

MITCHELL Okay. Standing still now.

SHEPARD Okay. So is Al. The cover is off of the laser and it is completely clean.

CAPCOM Roger.

SHEPARD And it did not move during the cover removal.

CAPCOM Roger, Al.

CAPCOM And if you can do without moving around we'd like to get an AMU status report.

SHEPARD Okay. This is Al, 3.75, 50 percent. I have no flags, mid cooling and I'm comfortable. Everything is beautiful.

CAPCOM Roger.

MITCHELL Okay. This is Ed. I'm 3.75, 34 percent. I'm mid cooling, no flags, feel great.

CAPCOM Roger. Got it.

CAPCOM Ed, this is Houston. You're go for thumper activity. We will require that you and Al stop 20 seconds before hand and let it quite down. They're very sensitive.

MITCHELL Okay. You're giving them from all 3 geophones, Houston?

CAPCOM That's affirmative.

MITCHELL Okay. Here goes the first one.

SHEPARD Okay.

MITCHELL Do I need 20 seconds now, Houston?

CAPCOM That's affirmative.

MITCHELL Okay. Start it counting.

MITCHELL 5, 4, 3, 2, - Start over. 5, 4, 3, 2, 1, - -

END OF TAPE

MITCHELL 1, fire. I didn't feel anything, Houston.

CAPCOM Roger, we copy. Stand by.

SHEPARD Ed, I'm going to mosey on back and start taking pictures in the meantime.

MITCHELL Okay.

PAO That was to have been the first of 21 thumper firings. We'll stand by.

CAPCOM Ed, this is Houston. We saw an ARM and a DISARM signal on that. We would like for you to attempt to fire squib number 1 again at the same location. Over.

MITCHELL Okay. I haven't moved. Al, if you'll hold your position we'll give them another go at it.

SHEPARD Okay, I'm ready.

MITCHELL 5, 4, 3, 2, 1, fire. Okay, we got it that time, Houston.

CAPCOM Roger, very good.

MITCHELL Okay, it's a hard trigger that's all. That was the problem.

CAPCOM We copy.

MITCHELL (garbled) Okay.

SHEPARD Houston, did you know that - filming that last magazine at 6 frames per seconds, did you take that into account?

CAPCOM That's affirmative. 6 frames per second was nominal 15 minutes and we ran for almost 20.

SHEPARD Okay, the little ball indicator was indicating empty. Okay.

MITCHELL Hey Al, I'm ready for another one.

SHEPARD Go.

PAO Mitchell standing close to the third geophone for that first firing.

MITCHELL 5, 4, 3, 2, 1. Tell her to try it again.

MITCHELL 5, 4, 3, 2, 1. Fire. A hair trigger this isn't.

CAPCOM Okay, Ed. We copy it fired on that one. We see it -

MITCHELL Okay, echo echo is coming off and delta delta going on.

CAPCOM Roger, understand dover delaware going on the 16-mm camera.

SHEPARD Oh, dear.

MITCHELL Okay, Al, I'm ready for another one. And Houston, this is number 2.

CAPCOM Should be number 3, Ed.

MITCHELL Okay, counting from zero it's number 2.

CAPCOM Roger, counting from zero it is number 2.

MITCHELL All right, 10. 5, 4, 3, 2, 1 fire.

CAPCOM Beautiful, Ed.

SHEPARD Okay, all set for juliet juliet. Starting fram is 6.

CAPCOM Roger, frame 6, judge jacardo java.

END OF TAPE

PAO That was -

SHEPARD Do you have to be so prosic.

MITCHELL Okay, Al, I'm ready when you are.

SHEPARD Go ahead.

PAO Coming up on thumper firing number 4. There done 15 feet apart.

SHEPARD 5 4 3 2 1, fire, 1 2 3 4 5. That's very good.

MITCHELL I'll tell you, this thing has a pretty good kick to it.

CAPCOM Okay, good shot, Ed.

MITCHELL It feels like firing both barrels of a 12 gage shotgun at once.

CAPCOM Roger.

MITCHELL Houston, am I on number 5 now?

CAPCOM That's affirmative. Counting from 1 you're on number 5. Counting from zero, you'd be on number 4, over.

MITCHELL Okay, give me the count from zero. That's what I'm marking on.

CAPCOM Okay, from zero you're on number 4.

MITCHELL Okay, Al, I'm ready.

SHEPARD Okay.

MITCHELL Yea I'm ready go ahead.

SHEPARD I'm not being facetious, Bruce. That's the way it's marked.

CAPCOM Okay, I'm not fighting you.

SHEPARD 5, 4, 3, 2, let's try that one over, it moved. 5, 4, 3, 2, 1. Okay, let's try it again, 5, 4, 3, 2, 1.

MITCHELL Well I didn't get a fire out of number 4, Bruce.

CAPCOM Roger, Ed. Let's go to the next position, next initiator.

PAO Although numbered 4, that was, would have been firing number 5.

MITCHELL 3, 4, 5. I can't get that one to fire either.

CAPCOM Okay, Ed. What I meant was the next geophone line station with the next initiator.

MITCHELL Okay.

CAPCOM So using initiator number 5.

MITCHELL Let me try this one.

MITCHELL Alright say again what you want me to do Bruce.

CAPCOM Okay, using -

MITCHELL On both number 4 and number 5.

CAPCOM Using your initiator number 5, you are to move on to the next station, which will be the 6th position.

CAPCOM 1,2,3,4,5,6, and try it again.

MITCHELL Okay.

CAPCOM And Ed, and Al, for your information you've been out 3 hours and 35 minutes and you're about 35 minutes behind the nominal time line with a half hour extension expected.

MITCHELL Roger.

MITCHELL Okay Al, I'm ready to try again.

SHEPARD Okay, go ahead, Ed.

SHEPARD 5, 4, 3, 2, 1.

MITCHELL It just won't fire. Okay chart try that initiator once more.

CAPCOM Roger, repeat that one at the same location.

END OF TAPE

MITCHELL Roger. 1, 3, 4, 5 -
CAPCOM Hold the arm for 10 seconds.
MITCHELL Okay, let me reinitiate the arm.
CAPCOM Roger.
MITCHELL 123 5678910 fire, it won't go Bruce.
CAPCOM Okay, next ignitor, next geophone station.
MITCHELL Roger.
MITCHELL Okay, Al, I'm ready.
SHEPARD Okay, go ahead.
MITCHELL Bruce, do you want a 10 second arm on this one or 5.
CAPCOM 10 seconds please.
MITCHELL 54321 fire, got a good one. 345.
CAPCOM Roger, Ed.
MITCHELL Hurrah, we got one.
CAPCOM That was a good firing.
MITCHELL It was afraid not to. I told it I was going to break it in half if it didn't fire on that one. Okay, I'm ready for the next one.
SHEPARD Okay, go ahead.
MITCHELL Here we go.
CAPCOM Ed, this is Houston. We'd like you to proceed to the central geophone, that is geophone number 2 soil ignitor number 11, or make that ignitor number 10 by your count, and fire that one off. Over.
MITCHELL Instead of the one I'm firing right now?
CAPCOM That's affirmative.
MITCHELL Alright, just about to push the trigger. Oh, oh, that's what I was afraid of Bruce. This one pulled out.
CAPCOM Which one pulled out?
MITCHELL The middle geophone is not in the ground.
CAPCOM Okay, if you can reemplace it, do so.
MITCHELL I shall. This ground is so soft that apparently, that just a tug on the cable lifted it right out.
CAPCOM Al, this is Houston. What are you photographing now? Over.
SHEPARD Right now I'm taking the distance shots back to the LM from the RTG.
CAPCOM Roger. Out.
SHEPARD Coming down to photograph the SIDE.
CAPCOM Roger.
MITCHELL Okay, Houston. Number 11 it is.
CAPCOM Roger. Your ignitor number 10 and you're at the second geophone.
MITCHELL Okay, that's affirm. Al, I'm ready when you are.
SHEPARD Go ahead.

END OF TAPE

MITCHELL 5, 4, 3, 2, 1 MARK. Good shot.

CAPCOM Roger. Al, you're released from the constraint for - of holding still for a period of time prior to and after the geophone thumps. Ed must still abide by the 20 second before and 5 second after rule. Over.

SHEPARD This is Al. I understand.

MITCHELL Okay, Bruce.

PAO Shepard now taking still photos of the ALSEP deployment, while Mitchell firing the thumper.

PAO 3 hours, 43 minutes since cabin depress.

CAPCOM Ed, this is Houston. We're expecting you to thump at each station from there on in.

MITCHELL Okay. Houston here is number 11 coming up.

CAPCOM Roger.

MITCHELL 5, 4, 3, 2, 1, Fire. Good shot.

CAPCOM Roger.

SHEPARD You should have threatened it earlier in the game.

MITCHELL You're right.

MITCHELL Okay. Number 12. 5. 4. 3. 2. 1 Fire. Good shot.

CAPCOM Roger, Ed.

MITCHELL (garble) for the devil.

MITCHELL Okay, number 13, Houston.

CAPCOM Roger.

MITCHELL 5, 4, 3, 2, 1, Fire. No fire.

CAPCOM Okay, Ed. Press on to the next station. The next ignitor

MITCHELL Okay.

MITCHELL Are you getting any decent signals back, Bruce?

CAPCOM That's affirmative, Ed.

MITCHELL Okay. I'm on ignitor 15.

CAPCOM Al, this is Houston. We need to have you stand still again.

MITCHELL Okay.

CAPCOM And I show that you ought to be on your ignitor number 14, Ed, unless - -

END OF TAPE

CAPCOM Ed, that was one you last used.
MITCHELL DIT.
MITCHELL 5, 4, 2, 1, fire. No fire. Let me try it once more, Bruce. Mark. 1 fire. No fire. Okay, I'm moving on.
CAPCOM Roger, move on.
MITCHELL Number 15. Okay.
MITCHELL 5, 4, 3, 2, 1 fire. No fire.
CAPCOM Roger, next geophone, next position. Or not next geophone, next station, next squib.
MITCHEL Rog.
PAO Three hours 49 minutes since cabin depress.
MITCHELL Okay, Al.
SHEPARD Ed.
MITCHELL 5, 4, 3, 2, 1 fire. Good shot. 2, 3, 4. 5.
CAPCOM Roger, understand good shot on your igniter - 16.
MITCHELL That's affirm. Okay, number 17.
SHEPARD Okay.
MITCHELL 5, 4, 3, 2, 1 fire. Good shot. 2, 3, 4, 5.
CAPCOM Roger, Ed.
MITCHELL Okay, number 18.
SHEPARD Okay, go ahead.
MITCHELL 5, 4, 3, 2, 1 fire. Good shot. 3, 4, 5.

END OF TAPE

MITCHELL These latter shots are firing like they're supposed to, Bruce?
CAPCOM Roger, Ed.
MITCHELL Good easy pull and it doesn't seem to be kicking quite so hard. Maybe I'm just pushing on it harder. Okay, Al.
SHEPARD Okay, go ahead.
MITCHELL 5, 4, 3. 2, 1, fire. Good shot. 2, 3, 4, 5.
CAPCOM Roger, Ed.
MITCHELL And we only have one left, Bruce.
CAPCOM Okay, how many positions do you have to go?
MITCHELL I'm on 20 and I'm on my last position.
CAPCOM Beautiful.
MITCHELL I'm at the last geophone.
CAPCOM Beautiful.
MITCHELL Oh, okay. I'm saying we got a shot to spare, but we must have had 22 charges.
CAPCOM Ed, this is Houston, we'd like both of you to stand still for a minute here to get a calibration curve.
MITCHELL Okay.
CAPCOM And bear in mind that you told me that you started with charge number 0. So 0 to 20 is 21 charges, and we come out even.
MITCHELL Yes, I understand that. I've never seen one fire on 0 before. But I've never fired flight hardware before.
CAPCOM Ed, now are you both holding still for the calibration here?
SHEPARD Affirmative.
MITCHELL And the pumps are running on our PLSS.
CAPCOM I wouldn't want you to shut those off.
MITCHELL Thank you.
CAPCOM Okay, go ahead with the last shot, Ed.
MITCHELL Okay, here we go.
SHEPARD I'm ready.
MITCHELL 5, 4, 3, 2, 1, fire. Good shot.
CAPCOM Good show.
MITCHELL 3, 4, 5.
SHEPARD Okay.
SHEPARD Okay, Al has completed the photographic coverage of the ALSEP and Juliet Juliet counter number 34. And would you tell us now how much, Counter number 34, Ed. Would you tell us now, how much longer we have before we have to be back at the MET for closeout?
CAPCOM Roger. Counter 34 and Stand by.

PAO Good firing on the last thumper.

SHEPARD Not a bad batting average. Big league stuff.

MITCHELL Hoping to get a few more shots off than that. Okay, we ought to look around the ground for the - I think we'd better have a little change in strategy here. Okay, Houston, the -

CAPCOM Al and Ed, this is Houston. With a 1/2 hour extension you have 18 minutes until you have to be back at the MESA.

MITCHELL 18 minutes and 30 extension is what we have, is that correct?

CAPCOM That's Roger. You are 3 hours and 56 minutes into the EVA at this time.

MITCHELL Okay, in that case then, we'll arm the mortar package at this time before we leave and proceed back along our track getting Geology along the way.

CAPCOM Roger. We concur.

SHEPARD Hey. If you wait a minute, I'll come over and help you with that thing, Ed.

MITCHELL Okay, Houston. Did you copy that switch number 5 is clockwise and safe?

CAPCOM Roger. I now copy that switch number 5 is clockwise and safe.

MITCHELL Okay, we're going to arm the mortar pack. And now I'm going to pull the safety rods, hold her down.

END OF TAPE

CAPCOM Al -

CAPCOM Al, and Ed, this is Houston, after arming the morter pack, we'd like you to proceed back in the general direction of the LM and selecting a suitable area in route, collect a comprehensive sample and try to pick up a football size rock on the way, over.

MITCHELL Okay, that's our intent, Houston.

CAPCOM Okay, and I'll give you periodic reports on how much time you've got left until you have to be back at the MESA.

MITCHELL Okay.

SHEPARD Okay, it's a little off level now.

MITCHELL We'll relevel it and try.

SHEPARD Okay.

MITCHELL Okay. I'm fixing to relevel it right now.

SHEPARD I'll press on, and back and look for a good spot for this.

MITCHELL Okay.

SHEPARD Houston, the safety rods are out of the morter pack.

CAPCOM Roger.

PAO Ed Mitchell now arming the morter pack for firing sometime within the next year.

CAPCOM Al, and Ed, mark, four hours into the EVA.

MITCHELL Okay.

CAPCOM With the half hour extension we're working into a 4 hour and 45 minute EVA duration.

PAO We're at 118 hours 19 minutes Ground Elapsed Time.

CAPCOM And Al, would you confirm that you have the extension handle off the thumper geophone anchored.

SHEPARD I will have it when we leave here. I don't have it yet.

CAPCOM Roger, out.

MITCHELL Okay, Houston, the morter pack is lined, but the bubble, change it to the inner ring, and I'm going to run it down, and point it almost due north, a little bit to the west of north. I guess Al's photographs will allow you to get that exactly.

CAPCOM Roger, bubble tangent to inner ring and almost due north.

MITCHELL The tangent to the inter ring on the northwest side.

CAPCOM Okay.

MITCHELL Both arming switches are on, on the mortar pack. Switch number 5 is going back counter clockwise.

CAPCOM Okay, stand clear.

END OF TAPE

MITCHELL Okay. Switch 5 is armed.
CAPCOM Okay. You got the safety -
MITCHELL It's had 15 feedback when it's - -
MITCHELL - - 15 feet away when that cable's only 10 feet long.
CAPCOM Roger, we copy and you got the safety rods - the two switches on the pack, switch 5. Beautiful.
MITCHELL That's affirm.
PAO Kitty Hawk accomplished her plane change by the book. Now circling the moon on the 19 rev.
MITCHELL Extention handle and I'm starting out after Alan now.
MITCHELL Hey, that's sure a different mode of traveling than carrying that barbell.
SHEPARD Okay, Houston, on this - into this comprehensive sample we're about a third of the way back to the LM. I'm not at an area exactly what I want, so I have drawn a circle which is approximately 2 meters in radius and I'm going to pick the surface rocks from that and the sampling of the surface fines from that area.
CAPCOM Roger, Al.
SHEPARD And I've photographically doc - I've documented this location with a locator shot back to the LM and to the ALSEP.
CAPCOM Roger, Al.
PAO That was Ed Mitchell that was performing the hopping.
MITCHELL Okay, Al. Need some help there.
SHEPARD Yes, I want to pick up all the walnut size-rocks in the tongs. Meanwhile we'll look at the surface fines, here.
PAO Shepard's heart rate now ranging -
MITCHELL Let's say they didn't know what to say.
PAO 75 to 85, Mitchell the same, 75 to 85.
MITCHELL Have to be careful that we don't put them on the ground. If you make consecutive passes at it the whole circle, we can tell.
MITCHELL Oh, damn.
SHEPARD (Garble)
SHEPARD With this amount of time we can really only get the ones that are essentially there.
MITCHELL Yes, let me grab another way bag, because you're too far away for me to - -
SHEPARD An inch in diameter.
MITCHELL Can't help you very well this way.
SHEPARD Put something together it in a minute.
SHEPARD I think I've got them, Ed.
MITCHELL Okay. I'll get one for the fines.
SHEPARD Get one for the fines and we'll start-

SHEPARD I'd just say, just pick up an undistrubed site out of each quadrant, that we didn't hit with our feet, cut it down to about a centimeter level and fill the bag that way.

MITCHELL You want the medium size scoop or the big scoop for this.

SHEPARD No, actually of the trenching tool, medium - now the medium size scoop is the best. All you're going to do is cut the surface to the depth of about a centimeter and we'll not disturb the area here wére we haven't picked up the rocks. Okay.

MITCHELL Okay. Bringing the stuff over right now.

PAO Shepard and Mitchell - -

END OF TAPE

PAO are collecting comprehensive samples.

CAPCOM This is Houston, we show about 8 minutes remaining until you should be at the MESA to start closeout.

SHEPARD Okay, we will be able to bring the compehensive sample at that time.

CAPCOM Beautiful.

MITCHELL Don't close it, here's one in here for that.

SHEPARD What?

MITCHELL Here's one in here I picked up.

SHEPARD Oh, okay. drop it in here then.

SHEPARD Very good.

MITCHELL Okay, I'll start over here in this undisturbed area.

SHEPARD Yeah, just get that area and then right here in this area. And fill up the bag to the line. Now head on back a little further, get a football-size rock.

MITCHELL Okay.

PAO Ground elapsed time 118 hours 27 minutes. 4 hours 8 minutes since cabin depress.

SHEPARD Okay. There's some pretty good sized ones back over in here.

SHEPARD Okay, that's too big. I'll get one that's a little smaller.

CAPCOM Al and Ed, 5 minutes.

SHEPARD Okay. You want to start back now, Ed?

MITCHELL All right, let me get about three more scoops, Al. I can get there before long.

SHEPARD Okay.

SHEPARD Okay, Houston, you can see where the area where the football-sized rocks are coming from. It's essentially 2/3 of the way back toward the LM from the ALSEP site. The rock appears to have been ejected from the crater which Ed was describing earlier from his 12:30 position.

END OF TAPE

MITCHELL As a matter of fact it's going to be the small foot size, football size rock - that turned out to be two of them.

CAPCOM Roger.

MITCHELL The second small football appearing on the same crater, from near the same crater.

MITCHELL And at first glance appears to be fairly similar color. It's a large hand sample. It's essentially not vesicular. Just some very small vesicules. The -

CAPCOM Roger. We've got two minutes we'd like to get you on back to the vicinity of the MESA.

MITCHELL What looks to be a fairly large crystal in that second ball - football rock and now, starting back toward the MESA now -

SHEPARD And I'm on my way too.

CAPCOM Roger.

SHEPARD Hey, away we go.

MITCHELL The number of surface rocks and rocks compared with the number of surface fines is very, very small, Houston. It is - There's a few boulders lying around and there's a few blocks around some of the craters but by and large, it's a powery surface. Don't run into that crater, Al.

SHEPARD Don't worry, Babe. Little slow in one direction here.

SHEPARD -ing pretty well.

MITCHELL Yeah, how about keeping your eye on it cause -

SHEPARD I am.

PAO 4 hours, 14 minutes -

MITCHELL _ sound of it more than this when I left the site.

SHEPARD Okay, we're coming back down hill, Houston.

CAPCOM Roger, Al. We're seen you going across the TV camera and it looks like you've gotten back to the MESA here with about ten or fifteen seconds to spare on our mark. We do have plenty of time for the nominal closeout so we don't want you to rush that. Just go through the procedures and we'll take the timing as it comes. When you have a moment, we'd like to get an EMU status report.

MITCHELL Okay.

MITCHELL And since I'm coming by the camera Houston, I'll turn you around.

CAPCOM Roger. And we'll put the zoom on up - zoom on about for you - overdue.

PAO Shepard, Mitchell returning with two small football size rocks and F-44.

MITCHELL How's the field of view right now?
CAPCOM It's pretty poor right now.
MITCHELL Okay. Just a minute.
SHEPARD Okay.
MITCHELL Twist 40.
CAPCOM Okay, can you elevate the camera a little.
MITCHELL Yeah, I have to dig in her - bag, how is that.
CAPCOM Okay. Good. Very good.
MITCHELL Okay.
MITCHELL Oh, damn it. There went my sample bags.
SHEPARD Put your, your HT handles for it.
MITCHELL We'll use the - this handle. Fortunately all big (garble) -

END OF TAPE

MITCHELL (garbled)

PAO Mitchell, Shepard apparantly switching jobs with Al Shepard pulling the MET bag.

SHEPARD That bin is only half full.

SHEPARD Okay, Houston, for your information those location - documentary locations shots of the comprehensive sample taken on JJ and on I'm showing it 40.

CAPCOM Roger, JJ 40 for the compenhensive sample area.

MITCHELL Take this can you? Be careful you don't spill that but cause your hands are full too.

SHEPARD And on the compenhensive sample, Houston, I feel we have about 15 rocks and some fine. My weight bag is going in the SRC.

CAPCOM Roger. If you take an addition weight bag and put material from the immediate vicinity of the LM into it to fill up the SRC, we request that you drop a documented sample bag in it as a tag. Over.

SHEPARD Okay.

PAO The SRC is a sample return container.

SHEPARD Okay, I guess we've got a little room to do that. I put the football-sized rocks in the ETB.

MITCHELL Okay, did you put a 70-mm camera in the ETB?

SHEPARD You want a bag? Yeah, I put it in there.

MITCHELL Did you take out the TDS?

SHEPARD No, not yet.

MITCHELL Okay, it's probably in the bottom.

CAPCOM And Al, I show that you have a magazine on the 16-mm that's totally unused, dover deleware.

SHEPARD It's on the MET, Bruce, it never made it on the camera.

CAPCOM I think Ed put it on, put didn't start it.

MITCHELL Negative.

SHEPARD Oh, I'm sorry, I take it back, we did put it on.

SHEPARD Okay, where's that tin scoop?

MITCHELL Which one, the big one?

SHEPARD Why don't you let me help you with the - let's take the shovel back.

PAO By putting the footbal-sized rocks in the bag, the crew will take them into the LM with them between EVAs.

SHEPARD Look at that little crater out there. It looks like a secondary -

MITCHELL Okay, let's look at it.

SHEPARD Right out here.

MITCHELL I saw a little crater about this size out here that I'd swear -

MITCHELL had glass in the bottom of it, but I was too busy thumping to stop and make any comment on it.

SHEPARD Okay.

SHEPARD (garbled)

MITCHELL Yeah, they're all different color (garbled)

SHEPARD Yeah.

MITCHELL (garbled)

END OF TAPE

MITCHELL See at a different (garble).
SHEPARD Okay, how is that?
MITCHELL It can take another shovel full.
MITCHELL That's good.
SHEPARD Okay, descent is from a small crater, looks like it might be a secondary impact. (garble) It's about 2 feet in diameter.
MITCHELL And it's between 130 50 feet, 130 40 feet from the LM.
CAPCOM Roger.
MITCHELL And we'll put a documented sample bag in there with it.
MITCHELL We'll put a documented bag in there with and that will be bag number 1.
SHEPARD Here you go, Ed. Stick it in there.
MITCHELL Okay, put it in 1 November, 1 November.
CAPCOM Roger, out.
SHEPARD The computer and I will fill up this RC and that will do it very nicely.
MITCHELL Okay, very good.
SHEPARD There you go.
MITCHELL Okay, Houston, I'm getting the 2 used bags off the DEP. There going (garble).
CAPCOM Al, this is Houston.
SHEPARD Okay, That's too big, stick that in the ETB also. Go ahead, Houston.
CAPCOM Roger, prior to terminating the EVA, on the TV camera, we will need it set to F44, peak and aline so that the long axis of the camera is perpendicular to the sun. We'd also like to move the camera so that in this orientation we're still viewing the LM, over.
SHEPARD Okay. Fire F44 peak, in long direction normal to the sunlight.
CAPCOM Roger.
MITCHELL Al, did you get the, did you get to put the maps in - no the maps are right here.
SHEPARD No, I haven't done anything yet. I'm just (garble).
MITCHELL Okay.
SHEPARD Assembling the millimeter camera in the ETB and packing the (garble).
MITCHELL Okay.
SHEPARD And Houston, we were unable to get all of the playback in the SRC. It's full. We're putting the small samples, from small rocks from the comprehensive sample in the lay bag along with the 2 small football rocks.
CAPCOM Roger. I understand the football rocks are in 1 white bag, and you're adding another white bag containing the small rocks.
SHEPARD Right, 2 white bags and they're both in the ETB.

CAPCOM Roger.

PAO The small rocks will also be carried into the LM in a way bag.

MITCHELL I've got another 70 milimeter camera to go.

SHEPARD It's not very heavy.

MITCHELL I'm thinking about volume.

SHEPARD Okay, let's see if we can close now.

SHEPARD Okay, so SRC sereo 07 contains then, the organic control sample. Define from the comprehensive sample and the extra find from that small crater we collected near the LEM.

CAPCOM Roger, we copy those and the SRC.

SHEPARD 70 milimeter cameras, and 3 16 milimeters. That we didn't run off there, okay.

MITCHELL Yea, I got it all.

SHEPARD Okay, and the map should be there.

MITCHELL I've got the map already.

SHEPARD (garble). didn't we.

MITCHELL I've got it.

SHEPARD Okay, I'll move on out here, take care.

MITCHELL What are your -

END OF TAPE

MITCHELL You're tangled up in the cable.
SHEPARD Okay, 44 peak, normal.
MITCHELL Roger.
CAPCOM Roger, and we might as well go to 25 on the zoom, Al.
SHEPARD I just zoomed by you.
CAPCOM We saw you zoom by us.
SHEPARD Verify 44, 44 on the zoom, I mean 44 on the F-stop 25 on the zoom - minus infinity.
CAPCOM Just a minute, Al, I've got to configure one more camera here.
SHEPARD 30 on the focus. We're transmitting and we're in peak and we're long axis is normal to the sun. How is that?
CAPCOM Roger, Al.
SHEPARD You want the lens cap ON or OFF.
CAPCOM Lens cap OFF. O F F.
SHEPARD OFF. Okay, ETB contains 2 medium football rocks and the small rocks in the comprehensive sample, 2 70 millimeter cams, 3 16 millimeter mags, map, lens, brush assembly.
MITCHELL They're all in there, I just checked them.
SHEPARD Good show.
MITCHELL And the SRC number 2 is on the map.
SHEPARD Okay, lets see if we can get you clean.
MITCHELL I think that completes my checklist.
CAPCOM Did I copy SRC number 1 sealed?
MITCHELL Prepare to lift the cable again.
SHEPARD Cable for cable. Say again.
CAPCOM SRC number 1, sealed and closeup camera OFF.
SHEPARD SRC number 1 is sealed.
MITCHELL And verify that close up cambea is OFF.
SHEPARD Okay, its going to be a -
MITCHELL Brush?
SHEPARD Yes.
MITCHELL Okay.
PAO 4 hours 29 minutes now -
SHEPARD Okay?
MITCHELL I was trying to see if we could see - yes it's still here. Let's go at it. I don't know, golly you're a mess. That helps.
SHEPARD Yes, quite a bit. I just took the top.
MITCHELL It'll take awhile, but we'll get it there. Oh, these gloves are.
SHEPARD Pardon? Okay, press on.
SHEPARD Take this.
MITCHELL Get into your connectors there.
SHEPARD Hey, Houston. How much time do we have to repress, now?
CAPCOM Alright, we're looking at 14 minutes and 20 seconds to scheduled end of EVA, about 12 minutes and 20 seconds to repress. You've got 1/2 hour margin in there.

CAPCOM A half an hour margin in addition.

MITCHELL Okay. We're going to use it getting clean, I think.

CAPCOM Roger. Just do the best you can and we'll keep you posted.

SHEPARD Alright.

MITCHELL Do you ever use soap on your clothes? Bet you been wallering in them.

END OF TAPE

MITCHELL Okay, come on around and let me get this other leg. Okay. That's good. Get them off good. Cause you're going to sleep in that hammock over me.

MITCHELL Okay. Turn on around toward me a little bit more. Those overshoes are impossible.

SHEPARD They came off pretty well.

MITCHELL Yes. I think we can do best by kicking them off and now, you can get them off about as fast as I can -

SHEPARD All righty. Turn around and let me get the sun on you, probably better. Okay. Okay, inside. Okay. Turn around. Okay on the inside. Okay, you're pretty clean on the torso. Few on the hoses. Not too bad. Most of this stuff seems to be coming off fairly well - -

MITCHELL Yes. It comes off if it's not too much rubbed in, if it's just laying there it brushes off well.

SHEPARD Have a UHT still on.

MITCHELL Okay. I'll take it.

PAO Shepard and Mitchell cleaning themselves off now.

SHEPARD Okay. Now, not much we can do with that. Okay. Yes. It comes quite a bit of that stuff comes off especially off the back. That's a lot better.

SHEPARD Okay.

MITCHELL Okay, ready?

SHEPARD Wait a minute, I've got a -

MITCHELL Hey, you're in the S-band cable.

SHEPARD S-band cable. Let's - get the inside of you there. And the other side. That's the end of that.

MITCHELL Okay.

SHEPARD Here you go, put a pair of thongs in that. Did you hit it?

MITCHELL No, these tongs will never pick it up. You can help me with it, though.

PAO 4 hours and 34 minutes now.

MITCHELL Got it.

SHEPARD Okay. All righty, let's press on here. Okay. I want to get this baby out in the sun.

MITCHELL Lay that right there until tomorrow.

MITCHELL Okay.

SHEPARD Got your cable again.

MITCHELL Hold it. Al, hold it.

SHEPARD Holding it.

MITCHELL Come up to -

PAO The - -

MITCHELL Okay, I'll go ahead and start up the ladder and you can pass me the ET - pass me the - -

SHEPARD Yes. Go ahead.

CAPCOM Ed and Al, Houston. We'd like to get a final AMU status report.

PAO The MET being parked in the sun.

SHEPARD Okay.

MITCHELL This EMU is about 4 feet in the air right now.

SHEPARD This is Al, 3.75, and I'm reading 40 percent, no flags and low flow and I feel fine.

MITCHELL Okay. At 3.75, reading 20 percent, and no flags, minimum cooling and feel great.

CAPCOM Roger. Thank you, Ed.

END OF TAPE

MITCHELL Got it?
SHEPARD Got it.
MITCHELL Piece of cake.
SHEPARD I believe you fellows (garble) is rock. Pick them. MESA with you.
SHEPARD How's that pretty redhead doing, Houston?
MITCHELL I don't think they heard you.
CAPCOM Oh, yeah. We did too, Al. He's doing fine up there taking photographs and he just passed by you about ten minutes ago. Over.
MITCHELL Did he ever get it fix - high comm camera fixed?
CAPCOM Okay. Negative on the high comm and he was able to spot the LM on the last pass. Over.
SHEPARD Ah, beautiful. Beautiful.
MITCHELL Okay, Houston. I'm at the door waiting for INGRESS.
MITCHELL Getting ready to open the hatch now.
CAPCOM Roger, Ed.
PAO Mitchell ready to get back inside.
MITCHELL Ingressing.
PAO Going in now.
SHEPARD Okay, the -
CAPCOM Where's the SRC?
MITCHELL Say again.
CAPCOM Did the SRC get up to the platform?
SHEPARD Garble
MITCHELL Yeah.
PAO That's a sample return container.
MITCHELL LM is parked in the sun, 45 degree angle. S-band cover is on it. It looks like it's going to spend the night very comfortably.
CAPCOM Roger.
SHEPARD Okay.
MITCHELL The TVs ready to go.
SHEPARD Okay. Get mine. And on (garble) away we go.
MITCHELL Humming.
PAO 4 hours, 39 minutes -
MITCHELL Up on the porch now.
PAO Shepard preparing to go up there. To go inside.
MITCHELL The other side of the hatch now. Coming in the hatch. It's all yours. Okay. Do you have it?
SHEPARD I've got it.
MITCHELL Okay.
PAO Inside at 4 hours 40 minutes since cabin depress.

MITCHELL Houston, Al's starting up the ladder.
CAPCOM Roger. Did you get everything in the one ETB?
MITCHELL Yeah.
CAPCOM Roger. Very good.
MITCHELL Okay. Al's up at the top of the ladder waiting for the LEC to come out.
SHEPARD Now Al's up here.
MITCHELL Okay.
PAO The LEC is the equipment belt.
SHEPARD Okay.
SHEPARD Here is the LEC.
MITCHELL Okay.
SPHEPARD Put your - -

END OF TAPE

MITCHELL Okay, are you ready for the sample box?

SHEPARD Pass it in.

SHEPARD Wait a minute I'll give it up to you a little higher.

MITCHELL Just push it right on in. I've got it.

SHEPARD Okay, the SRC is in the cabin, Houston.

CAPCOM Roger, Al.

MITCHELL And Al will be starting in moments.

PAO The first sample return container.

MITCHELL I'm at the door.

SHEPARD Alrighty.

SHEPARD Okay, are you behind the door?

MITCHELL No, your hoses are in my way. I'm coming around the other way.

SHEPARD I had those babies pulled pretty far back. I guess they came out again.

MITCHELL Between your hoses and the ISA, which keeps falling off the hook, it gets pretty messy. Okay, come on in.

SHEPARD Okay, I'm going through the hatch.

PAO Shepard reports he's going through the hatch.

MITCHELL Just a second, I'll steer your antenna.

MITCHELL Okay. Come on through.

SHEPARD All clear.

MITCHELL Yep.

MITCHELL Roll toward me, roll toward me.

SHEPARD Okay.

MITCHELL Come on up. Turn to your - clear -

SHEPARD Coming around.

MITCHELL Okay.

MITCHELL Think about it first. Okay Houston, Al is in the cabin and PLSS feed water coming off.

CAPCOM Okay, Al is in the cabin and PLSS feed water off.

MITCHELL And Ed's feed water is off.

CAPCOM Roger, Ed.

PAO Both crew members in cabin now.

MITCHELL (garble). Lean forward. Getting ready to close the hatch.

MITCHELL Okay, the hatch is closed and locked.

CAPCOM Roger, the hatch.

PAO Hatch is closed and locked.

END OF TAPE

MITCHELL If I can turn? I can.
MITCHELL (inaudible) that was REPRESS AUTO. Circuit breaker. 7 REPRESS CLOSED.
SHEPARD (inaudible) Circuit breaker in.
MITCHELL Say again.
PAO Repressurization taking place now. 119 hours 7 minutes GET.
MITCHELL (Inaudible)
CAPCOM Al and Ed. This is Houston. Over.
SHEPARD Go ahead Houston.
CAPCOM Roger. We request that you do not break your suit PLSS integrity until we call you again. Over.
MITCHELL Okay.
SHEPARD I'm not reading you (inaudible)
CAPCOM Ed, this is Houston.
MITCHELL Okay, Ed. As you may have noticed, during the EVA and infact, during the predepressurization checklist, your suit leakrate seems to be somewhat higher then Al's, although within spec. At this time we'd like you to run through the normal pressure integrity check on your suit PLSS combination as called out at the 52 minute mark prior to depress on the EVA 1 card. Al can proceed to reconfigure himself onto the LM ECS. Over.
MITCHELL Stand by.
MITCHELL Why don't you go here and I'll go ahead.
SHEPARD Okay, I'll go here.
MITCHELL Okay, that was plus 4.6.
SHEPARD Okay.
PAO Cabin pressure reported at 4.6, that's 4.6 pounds of pressure.

END OF TAPE

PAO During the active seismic experiment the science support room recorded 13 thumper firings.
SHEPARD They can't do this.
PAO Meanwhile all alone in Kitty Hawk, Stu Roosa - -
MITCHELL I'm just going to blow mine up here in a minute.
SHEPARD What? Go ahead. Do it.
SHEPARD (garble)
SHEPARD - - circuit release, AUTO
MITCHELL (garble)
SHEPARD (garble) pressure cabin.
SHEPARD Okay.
MITCHELL Okay.
SHEPARD Okay. Cabin gas returns in AUTO (garble) and pressure cabin.
MITCHELL Okay. Let's get the EVA circuit. - - Breakers.
PAO Stu Roosa performed plane - -
PAO - - plane change number 1 right on schedule - -
PAO - - with a Delta-V of 370.5 feet per second, a burn time of 18.45 feet per second, this is done in a ground elapsed time of 118 hours and 9 minutes, 35 seconds.
PAO Kitty Hawk now in an orbit of 62.1 nauticle miles by 57.6 nautical miles. And this Apollo Control, Houston at 119 hours 13 minutes.
MITCHELL Okay, Al.
MITCHELL Okay. (garble) Finish the rest of it. You can (garble)
SHEPARD Go ahead (garble)
MITCHELL What?
SHEPARD Go ahead (garble)
MITCHELL Guess that I'm going back to 57.
CAPCOM Say again, Ed.
MITCHELL I'm going back for this check.
CAPCOM Roger.
MITCHELL Let's see that's on the same page, isn't it?
CAPCOM That's correct. It's over in the left hand column.
MITCHELL It's at 52.
SHEPARD (garble)
MITCHELL (garble) is off. (garble)
SHEPARD Okay.

END OF TAPE

SPEAKER Okay.

MITCHELL DIP is down to 10 percent, and the pressure doesn't seem to want to come up.

CAPCOM Okay, stay in that configuration, and stand by.

MITCHELL Houston, the air is starting to get a little stale in this suit.

CAPCOM Roger Ed. Discontinue the check and go ahead with your post EVA systems configuration.

MITCHELL Okay.

SHEPARD Let me get your antenna.

MITCHELL (Inaudible). Where is my (garble).

END OF TAPE

SHEPARD Okay, I put it on top of the ETV. Okay, you got your purge valve. Okay, your purge valves in right.
MITCHELL Okay.
SHEPARD Next will be those 2 hoses.
MITCHELL Why don't you turn the fan off here.
SHEPARD Okay, very good.
CAPCOM Ed, this is Houston. We'd like to confirm that you have closed the O2 valve on your PLSS. Over.
MITCHELL That's affirm.
CAPCOM Roger. Out.
MITCHELL I'll double check it, Bruce, but - I verify it's closed.
CAPCOM Roger, Ed.
MITCHELL Hey, connect the other 2 hoses.
CAPCOM Okay.
SHEPARD Okay, got (garble) valve.
SHEPARD Is your PLSS pump off? Is your PLSS fan off?
MITCHELL Both are off.
SHEPARD PLSS water?
SHEPARD Connect to LM water.
MITCHELL Why don't you help me with the water.
SHEPARD Huh?
MITCHELL Your going to have to help me with the water connection, I can't close it.
SHEPARD I already did.
MITCHELL I said, I can't close that one.
SHEPARD Okay.
MITCHELL Pop this one in for me to, will you?
SHEPARD I put that one in.
MITCHELL (garble)
MITCHELL You stuck this one in that one. I didn't do very well.
SHEPARD Okay.
MITCHELL Just move PLSS to OFF.
SHEPARD Connect LM water.
MITCHELL Yes. (garble)
CAPCOM Antares, this is Houston. Over.
SHEPARD Go ahead, Houston.
CAPCOM Antares, this is Houston. We've been going through the COMM checklist. We'd like to leave the S-band transmitter and receiver in secondary. Over.
SHEPARD Okay, will do.

END OF TAPE

CAPCOM Antares, this is Houston.

ANTARES Go ahead.

CAPCOM Roger. We'd like you to pull the circuit breaker on the TV camera at this time. Over.

MITCHELL No sooner said than done.

CAPCOM Roger.

PAO This is Apollo Control, Houston. At 119 hours, 59 minutes we've completed the shift handover in Mission Control. Flight Director Milton Windler and his maroon team of flight controllers are now on. Capsule Communicator on this shift is Astronaut Gordon Fullerton. There will be a change of shift briefing shortly in the MSC News Center, main auditorium. At the present time, Flight Director Windler is reviewing the mission status with each of his flight controllers - going around the room checking status and also discussing the lunar lift off which will occur on this shift tomorrow. We're about one minute fifteen seconds from reacquiring the command module on its 20th revolution and at this time we expect that crewmen on both spacecraft are in the midst of an eat period prior to beginning their scheduled rest periods. We'll stand by for acquisition of Kitty Hawk now in about 45 seconds.

PAO This is Apollo Control at 120 hours, 15 minutes. We're ready now for the change of shift press briefing in the MSC News Center auditorium. We'll switch to that at this time.

END OF TAPE

PAO This is Apollo Control at 120 hours 40 minutes. During the change of shift briefings we have conversations going on with both the lunar module, Antares, and with Stu Roosa, in Kitty Hawk. We have tape recorded on the conversations with Antares and we'll be prepared to play that back. The conversations with Stu Roosa primarily concern the Hi Con camera. Capcom, Ken Mattingly, who is handling the CSM side of the capcom duties advised Roosa that tests on the ground indicate that the hicon camera may in fact be getting usable pictures and we asked Roosa to attempt to verify that the shutter is operating. This would add to the feeling of confidence that perhaps the hicon camera is operating properly. And Roosa was advised to operate the camera and to attempt to look down toward the aperture with a flash light and see if he could verify that the shutters were operating. If he can verify this, the plan at this time would be to use the hicon camera, the lunar photographic camera at the next opportunity to photograph the potential landing site at Descartes, which would be on the 25th and 26th revolutions. Roosa is finishing up a meal period, and as soon as he has completed with that, he's scheduled to enter a sleep period. We're in conversation with the lunar module at the present time. We'll pick up with tape recorded communications and then stand by to follow live.

MITCHELL Houston, Antares.

CAPCOM Antares, Houston. Go ahead, Ed.

MITCHELL We're about ready to give you some weights on return equipment.

CAPCOM Okay, Ed. Ready to copy.

MITCHELL Okay, we're ready to come up with the first bags. Stand by one. Houston, let me tell you what we've done. Remember Al said that we brought in the, the small rock from the comprehensive sample area in one weight bag.

CAPCOM Okay.

MITCHELL We couldn't get them all in the SRC. We got in, we got the contingency sample here, and it so happens that the material cracked in the contingency sample bag and it's leaking, so we're putting it in the weigh bag with these other rocks, and the weight of that total combination is 5 pounds.

CAPCOM Okay Ed, got you. The contengency samples in that weigh bag with a total weight of 5 pounds.

MITCHELL Rog. And Houston, the next bag has 2 toy size football rocks in it. And they weight 15 pounds total.

CAPCOM Okay, Ed. Stand by one, Ed.

MITCHELL And that's going into the left hand storage compartment.

CAPCOM Okay, left hand storage compartment with 2 little league footballs, 15 pounds.

MITCHELL Rog.

MITCHELL Okay, Houston, both of those rock bags are going to left hand storage compartment.

CAPCOM Okay Ed. That's the one with the contengency sample and the comprehensive, and the football ones, right.

CAPCOM That's affirmative.

MITCHELL Ed, if you'll stand by just 1 minute I need to copy these down to Stu, and I'll be right back to you.

MITCHELL Okay.

CAPCOM Antares, Houston. Okay, I'm ready to listen to you for a while. Anything else you might have.

ANTARES Okay, we want you to be discriminating about our samples now. We have the comprehensive rocks in the left hand stowage compartment. The comprehensive fines however, are in the SRC.

CAPCOM Okay, got that. The rocks, how about the comprehensive rocks in the stowage compartment and the finds in - SRC.

END OF TAPE

CAPCOM fines and the SRC.
MITCHELL That's affirm.
MITCHELL And MAG MM is replacing II.
CAPCOM Antares, Houston. Say again.
MITCHELL Okay. We replaced Magazine JJ on the Commander's camera with LL and II on the LMP's camera with MM.
CAPCOM Okay. We've got LL and MM on there now.
MITCHELL That's affirm.
MITCHELL Houston, Antares. Verify which are the two 16 millimeter MAGS that have been just used.
CAPCOM Roger.
MITCHELL Houston, Antares.
CAPCOM Go ahead, Ed.
MITCHELL Did you understand my question, Gordon?
CAPCOM I guess I didn't. I didn't realize there was a question. Go ahead. Say it again, please?
MITCHELL Okay. We have three 16 millimeter MAGS of which we only used 2. Can you tell me which two we used?
CAPCOM I'll have to check back. I'll give you an answer in a minute, here?
MITCHELL Okay.
CAPCOM Antares, Houston.
MITCHELL Go ahead.
CAPCOM Our records show that the used magazines are Charlie, Charlie and Echo, Echo. And the Delta, Delta should be the unused one. Over.
MITCHELL Okay. Thank you. That's what we thought.
MITCHELL Okay, Houston. We're making a slight deviation to our storage plan in the ETV.
CAPCOM Okay, Ed. Go ahead with it.
MITCHELL In addition to the three 16 millimeter MAGS called for we're also taking back out the one we didn't get used today.
CAPCOM Okay, Ed. Sounds like a good idea.
MITCHELL In addition to the black and white MAG kk's we're taking back out Juliet, Juliet. We've only used 40 frames off of that and we've got very few pictures of the LM and other appropriate type shots.
CAPCOM Roger. Juliet, Juliet, you're also going to take out on the second EVA.
MITCHELL That's affirm.
CAPCOM Antares, Houston.
SHEPARD Go ahead.
CAPCOM Just following in the check list here and looking at it. It looks to us like you'll probably get to the EVA debriefing at about - in an hour and a half - about 1:22. Does this agree with your estimate. We just

CAPCOM wanted to know to be sure to have the right people standing by.

MITCHELL It's not on this card. How far is it on the lunar surface checklist? Right now we're weighing SRC.

SHEPARD And we find that it weighs 43 pounds.

CAPCOM Okay. 43 pounds on the SRC. And if you're just proceeding down the card with no changes to it well then we'll figure it out when you get to the debriefing.

MITCHELL Okay. That's what we're doing.

SHEPARD Listen, we've had enough thrills today without changing our checklist.

CAPCOM We didn't really mean to suggest that, Al, we - just disreguard that, Al.

SHEPARD I was just kidding.

MITCHELL Houston. I'm standing by for my T3.

CAPCOM Antares, this is Houston. Say again, please?

MITCHELL I'm standing by for lift off table.

CAPCOM Okay.

MITCHELL And whatever else you have.

CAPCOM Roger, Ed. I've got them for 20 through 25, if you're ready.

MITCHELL Okay. A little late for 20. But go ahead.

CAPCOM Okay. I'll give it to you anyway. The (garble). 20 is 120, 46, 32. 21, 1224445. 23, - -

END OF TAPE

CAPCOM 23. There's - I meant 22. I meant 22. There's 1244306. P23 is 1264129. P24 is 1283951. P25 is 1303811.

MITCHELL Okay. Read P20 is 1204622, 21 1224445, 22 is 1244306, 23 1264129, 24 is 1283951, 25 is 1303811.

CAPCOM Roger. Your readback is correct. Short status on the CSM up there. He's in good shape. Done everything on the timeline right on the money. The only problem on board seems to be the topo camera. The plane change went well with the DELTA Vs 671 feet per second about 8 or 9 feet per second more than preflight which was just to circularize the orbit slightly. Over.

MITCHELL Okay. Good for him. Is he using the 500 - let's see what - the 500 millimeter in place of the hicon.

CAPCOM We're mulling that over - actually the substution won't occur until tomorrow and that's most likely what we'll do. We're running one more test on the hicon to verify that is indeed hopeless and then we'll back it up with the 500.

PAO This is Apollo Control at 120 hours 54 minutes. We've bid Stu Roosa good night. The Communication's Officer reports that he's turned his comm off in the spacecraft. He's scheduled to have a 9 and 1/2 rest period and we wouldn't expect to hear from him until that rest period is completed. The Science Briefing on EVA one which had been scheduled for 4:00 PM in the MSC News Center Auditorium has been cancelled. Dr. David W. Strangway, Chief of the Geophysics Branch at the Manned Spacecraft Center will be available at 7:00 PM central standard time in the MSC News Center main auditorium to answer questions concerning EVA-one. And at the present time we show Kitty Hawk in an orbit 61.8 by 57.7 nautical miles. Spacecraft current altitude is 58.5 and the velocity is 53 53. We'll be losing contact with Kitty Hawk in a little over 17 minutes as the spacecraft goes behind the moon on it's 20th revolution. We'll continue to stand by for any calls from the crew aboard Antares on the lunar surface. At 120 hours, 56 minutes, this is Apollo Control Houston, standing by.

PAO This is Apollo Control at 121 hours and 13 minutes and Kitty Hawk has just gone around the corner on it's 20th revolution of the moon. When next we reacquire the spacecraft, we would expect Stu Roosa to be asleep. He turned off his communications midway through this revolution at about 120 hours, 45 minutes and we did not hear further from him on the frontside pass. We'll continue to stand by for any communications with the lunar module, Antares. In a previous conversation with the crew on Antares, CAPCOM Gordon Fullerton queried

PAO them as to how there checklists were going and what looked like a good time to begin the post EVA debriefing and according to our figures here that would probably occur at about 122 hours, ground elapsed time.

ANTARES Antares.

CAPCOM Antares, Houston. Go ahead.

MITCHELL We've finished our meal whatever meal it was and we're off and running on the foot PLSS feed - water collection.

CAPCOM Roger and out.

ANTARES Houston, Antares.

CAPCOM Go ahead.

MITCHELL Rog. Please be advised that one RCU weighs .38 kilograms.

CAPCOM Roger, Ed.

PAO The RCU or remote control unit which Mitchell is referring to has a known earth weight and is used in calibrating the scales which are used to weigh the portable life support system feed water collection bags that have determined water usage rates on EVA-1 and these usage rates will then be used to compute the EVA-2 consumables and to determine the amount of water available for EVA-2.

MITCHELL Houston, the Commander's feed water is .2 .25 kilograms.

CAPCOM Roger, Ed. The Commander's feed water .25 kilograms.

MITCHELL Houston, the LMP's feed water 1. - no wait a minute .19 kilograms.

CAPCOM Roger Ed. .19 on your feed water.

MITCHELL Okay.

END OF TAPE

ANTARES Houston, Apollo 14, rather Houston, Antares.
CAPCOM Antares, go ahead.
ANTARES Okay, we've arrived at the EVA debriefing block. But, in the meantime, let us say to the medics that we haven't had any medication, but the Commander is DRD of 16051 and the LMP is 07049.
CAPCOM Roger, Ed. We copy that. I have 10 questions having to do with the EVA. We don't want elaborate answers because the questions cut into your sleep period. A couple general comments first, though. The CDR DKG electrode is erratic and the data COMM is erratic. We were going to ask you to do what you can by way of applying external pressure or any other good ideas you might have there to maybe get it working again, but do not unzip your suit to get to it. Over.
SHEPARD Okay, will do. We'll try a little pressure in the right places. In the meantime, we'd like to also report that we have completed both the 02 top off and the water recharge from both PLSS's. And the condition of the crew is excellent.
CAPCOM Roger, Al. Glad to hear it. About the start of the next EVA. We plan not to wake you up any earlier then scheduled, but if you are awake and are ready to go, we'll be beady to support an early regress on the next one. Over.
SHEPARD Okay, that sounds good. We'd like to plan on an early regress anyway, I think so that we'll be in a position to get the full EVA 2 and still get back here at the regularly scheduled timeline.
CAPCOM Roger. The LM status is completely opts normal. The consumables are in good shape. We believe that the steerable antenna problem that you had during descent was probably due to a multipen reception at AOS and we're predicting now that it will probably work okay for ascent. Over.
SHEPARD Okay.
MITCHELL Glad to hear that one.
CAPCOM Okay. Question number 1 about EVA 1. How do you feel about your planned second EVA now that you've done the first especially in terms of time and terrain. Over.
SHEPARD I think that the second EVA will go a little more smoothly with respect to the timeline. It's not as complicated as far as the equipment is concerned. We don't spend as much time moving around with scientific equipment. It's primarily a geological traverse. Once the thing has gotten by the first few minutes. And we should be able to be on the timeline and hang onto that real well. And we, of course, are again counting on at least a 30 minute extension to the nominal time so that's the reason we'd like to start early.

CAPCOM Roger. Do you feel the terrain will be any problem?

SHEPARD No we don't. We had no difficulty at all in transversing the terrain. As a matter of fact, we were even bouncing along, even with the barbells and the MET. The traversing is extremely easy, although we have a rolling landscape, and lots of craters to circumnavigate. I believe from looking at the (garble) we'll be able to get up there with no trouble at all.

MITCHELL I completely concur in that the undulating terrain is just a surprise. It's not that much more difficult.

CAPCOM Roger, Ed. Second question is " Would you please describe the Rim of Dublin, especially the blockiness." Over.

SHEPARD No, I don't think you'd call Dublin a rocky rill. The craters north and south of Dublin, of course, are both older craters, and had subdued rims. There are some rocks and ejecta at and near the vicinity of the rims, but, and there are a few blocks down inside, we can look at the west wall and see Dublin from here, and see a few good sized rocks, perhaps 3 or 4 feet at the largest. But I really wouldn't call them locking rimmed. They are pretty well subdued rims.

MITCHELL I concur. The biggest blocks we could see on the rim of Dublin correspond to these large ones I pointed out in my pad - TV pad. There are some of that size and maybe a little larger, but the population is minitual compared with the total rim area of Dublin.

CAPCOM Roger. Third question "How deep is the Dips Erosion Crater?"

SHEPARD It's not very deep at all. The photographs will show that its perhaps only 4 inches in maximum depth.

CAPCOM Okay, and can you describe the lineations and how far out they went, their orientation and direction.

MITCHELL Are these the lineations that I referred to earlier or are you talking about lineations from in the dips erosion.

CAPCOM The ones that you referred to earlier, Ed.

MITCHELL Okay, they're there, and I saw evidence of them in directions different then the exhaust would cause, but there just simply was not time to look at them. We can look at them tomorrow.

CAPCOM Okay. On the football samples, were they documented?

SHEPARD That's affirmative. They were documented with a serial before in the case of both pebbles and they were taken from the crater which is located at let's see, CR 1 and 646. They came from the southwest - in the southwest rim of that crater.

CAPCOM Roger, Al. Next question "Did you notice

CAPCOM any variation in soil mechanics, characteristics at various locations where legs or poles were pushed in?" Such as the solar winds staff, flagstaff or GS1 anchors and the geometer and so forth.

MITCHELL Yes, there are a few places around, primarily the throwouts from craters or what are, obviously near the rims of craters, have a softer material around them then there is just in general. However, there are so many craters that you find the soft material quite often. But generally, on the fresher ones. On my traverse, rather along the upper geophone line, there are 2 or 3 fairly fresh craters along that line that had quite soft material around them. And it was a matter of sinking in 3 or 4 inches instead of a normal 1/2 to 3/4 that we're sinking in out here.

CAPCOM Roger, Ed. On the surface features of rocks marks. Well, we'd like a description of the surface features of the rocks. If they are marked, variations in rounding, angularity, grain size, size distribution, shape texture, and color. Over.

MITCHELL Your getting into stuff that we're going to have to look at tomorrow. We just barely had time to finish the ALSEP and get back. The rocks I see from the cockpit, there are some rounded rocks and I see 2 or 3 that are varied, that have some rounding on top. I see some angular rocks. As far as granularity, crystal, size etc. etc. We didn't have time to look at any of that. We'll have to wait until tomorrow.

CAPCOM Okay, Ed. This next question probably falls in the same category. I'll read it in case you have anything to say about it. And that is to describe the

END OF TAPE

CAPCOM Okay, Ed, this next question probably falls in the same category. I'll read it in case you have anything to say about it, and that is to describe the regolith, the general nature, fragment distribution, fragment shapes variations in texture, color, surface patterns and firmness.

ANTARES Okay, we can give a quick one on that. I think we've already done most of it. Regolith is mostly about, brown, or sometimes looking gray powdery material. Sometimes like chalk, ground up, it's that thin, and that fine grained. There are a few rocks scattered around the population is less than a percent ranging in size from I guess 2 or 3 centimeters, but the ones that are obvious, that aren't burried are 5 or 6 centimeters, up to the largest ones that I've seen are the ones I showed you in the pan, which are 3, 4, or 5 feet across. The distribution is less than 1 percent, but you see a few of these rocks sitting all around the landscape as far as you can see and I guess even out over toward Doublet, which we didn't say was blockey, but these smaller ones might not be visible at that distance. And I can look through the door and I don't see too many on the far edge of the crater over there either, but it could be that that's too far away to be able to see them.

CAPCOM Okay, did you notice any variations in color or surface patterns or texture?

ANTARES To me it looked all about the same as far as the general regolity here is concerned, but again we haven't looked at it that carefully, or I didn't look at it that carefully, just because of the press of time. By in large it is all this very fine grain material with a few scattered rocks on top of it. Let's see if we can do a better job of describing it tomorrow for you.

CAPCOM Okay.

ANTARES Yea, I think that's generally true. We can see areas, for example, looking normally out the window, that is in the cross sun direction, when I came to the belt where the rocks, in 1 ejected pattern of fairly large rocks of 3 or 4 feet appeared to have a very lighter gray texture to it, and compared to the gray brown which Ed, described which would be the regolity. And I noticed that this crater that sits out here to the 9:30 position of the LM is also a brighter crater. It's a newer crater, it has a raised rim. It has a different color, than for example, than does the crater directly behind it. It's about the same distance, it is much older and a darker gray.

CAPCOM Roger, Al.

ANTERES We'll find some variations. I think generally we'll find some variations in texture throughout tomorrows traverse.

CAPCOM Roger, how abundant was glass?

ANTARES The only place I thought I saw glass and I didn't have time to confirm it, was in a very small crater along the thumper line. It looked like there was pools, a little pool of glass at the bottom, and this crater was only about 2 foot across and maybe 8 inches deep. There was quite a bit of small chunky material in it, but it had a different color and looked very glassy at the bottom, and I didn't have time to go back and look at it, but I'm sure there's somemore of that around.

CAPCOM Roger, last question is, how abundant were fillants. Did those by the LM appear to be disturbed by the DPS, over.

ANTERES I think we found some fillants. I don't know whether the percentage is as high as 50 percent or not, of the surface rocks, but, yes there is some filliting and you'll notice in the small football size rocks, there is a fillet pattern around them. There is filliting here, of course very close to the LM, and it's hard to tell whether it's natural, or whether it's from the LM exhaust.

ANTARES I concur completely with that.

ANTARES Roger, that's all the preprepared questions. I'll check and make sure there's no last minute ones here.

ANTARES Okay, I might comment that, looking at our footprints, with the MET track and our footprints out to the ALSEP sight over to the camera, both looking down sun and cross sun, that the fresh dirt we've kicked up and turned over is noticeably darker, browner than the more mousey brown, lighter brown undisturbed regolith that's on top.

CAPCOM Roger, that's interesting. Ed, the last time you left the ALSEP sight, can you give us the last time you happened to look at the number 1 geophone. Was it still in place properly? Over.

ANTARES That's affirm. All 3 geophones were in good shape when I left them.

CAPCOM Okay. Antares, Houston. We're having some problem with the signal strength on the ALSEP. Is there any chance that the central station could have been disturbed such that the antenna alignment would no longer be proper, over.

ANTARES Not to my knowledge.

ANTARES No, I dont think either one of us went by there again. I took some pictures of it, but nobody touched it after the antenna was aligned.

ANTERES Well I touched it of course, in turning the number 5 switch off and on, but, gee, I didn't do anything.

CAPCOM Roger.

ANTARES Houston, we'd like to proceed with the checklist now. I'd like to make a request that we plan

ANTARES starting the timeline tomorrow one hour early, so that we'll be able to get in a 30 minute extension and still have time after we get back in to have a leisurely restowage.

CAPCOM Okay, Al. We'll go along with that all the way. We'll plan to start 1 hour early, in fact if, we're not reccomending it but if you want to start earlier than that we'll be ready to support. You don't need to worry about support here. Over.

ANTARES Well let's see. Our nominal rest period ends at 130 hours and 30 minutes. We'll be a good 6 hours, 6 hours and a half. Why don't we say 129 hours even, and you wake us up if we haven't called you by then.

CAPCOM Okay we're checking that figure, and I'll give you a confirmation here if I get it.

ANTERES Okay, I don't think we're going to sleep more than 6 hours anyway and we'll be in bed so that we get 6 and a half hours. The way we're going now, all we have to do is rig the hammock.

CAPCOM Roger.

ANTARES Houston, if you concur, I'll go ahead and select down voice back up. Turn the power amp off and get the VHF antenna to AFF which constitutes the last part of my com checklist.

CAPCOM Okay, Ed, stand by 1. Antares, Houston, one final question. We noticed your h20 separator in the PLISSes were running kind of fast, do you have any problem at all with water in your suits?

ANTARES No, neither one of us.

CAPCOM Okay, I got that a little wrong. It's the separator in the LM suit loop, so it'd be a problem with water while you on the LM suit loop.

ANTARES None, that we've recognized so far.

CAPCOM We'll go along with, we'll ring the alarm at 129 hours, and I think that completes all the items we have for you. You are clear to go ahead with the last 3 steps on, before configuring for sleep, over.

ANTARES Very good. We'll press with that now, thank you so much.

END OF TAPE

CAPCOM Antares, Houston. Don't bother to acknowledge, but we're getting ready to do a station hand over. You may hear a burst of noise.

PAO This is Apollo Control, at 122 hours, 23 minutes. Both crews now are in the rest period. During the communications that we had with Antares on the Lunar Surface we reacquired Kitty Hawk now in its 21 revolution of the moon. Our surgeon reports that bio-medical data does not indicate that Stu Roosa has yet dropped off to sleep. And of course, you've heard Shepard and Mitchell advise that they're pulling the circuits - pulling the COMM circuits and preparing to go to sleep at this time on the lunar surface. During the EVA debriefing, Shepard reported that he and Mitchell are in excellent condition. He said he would like to see at least a 30 minute extention on EVA 2 and requested that Mission Control awaken him and Mitchell at 129 hours ground elapsed time. Normal wake up time would be 130 hours, 25 minutes. And flight director Milton Windler advised his flight controllers that they should be prepared for an EVA starting as much as 1 hour and 15 or 20 minutes earlier than the nominal time in the flight plan, although he said he did not expect that it would in fact begin that much earlier, they should be prepared for an EVA starting as much as 1 hour to 1 hour 15 to 1 hour 20 minutes ahead of the nominal flight plan time. There was also a question put to the crew in Antares as to whether or not they noticed any water in the suit loops. This was based on telemetry data here in the Control Center which indicated that the flow separators in the LM suit loop were a bit higher than normal. In the past when this has occurred there has been times when the crews suddenly noticed water accumulating in the suit loop - in the suit - in the suits themselves. And Shepard and Mitchell both replied that they had noticed no water in their suits. We have about 47 minutes remaining before we loose contact again with Kitty Hawk on this revolution. We would not anticipate any further communications with either spacecraft, however, we will leave the circuits up should we get - should we receive a call from either crew. Flight Director, Milton Windler, checking the status around the room with his flight controllers. The report is that we look good going into the sleep periods. At 122 hours, 27 minutes, this is Apollo Control, Houston standing by.

PAO This is Apollo Control at 123 hours, 12 minutes. We're about to loose radio contact with the Command Module, Kitty Hawk on this the 21st revolution and we'll be reacquiring in about 45 minutes. We said good night to Stu Roosa aboard Kitty Hawk at about 120 hours, 35 minutes and from the spacecraft went behind the moon and we reacquired at - -

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PAO -- from the Spacecraft went behind the moon and we reacquired at 121 hours and 58 minutes. The surgeon reports that Roosa was asleep. Shepard and Mitchell aboard Antares said good night at 122 hours, 20 minutes and the surgeon say they were asleep within a matter of minutes, about 122, 28 for Shepard, sleep time and Mitchell asleep shortly thereafter. Prior to going into their rest period Shepard reported that he and Mitchell were in excellent condition and requested that the EVA time lines be advanced to allow them at least a 30 minute extention on the EVA which would mean a 30 minute minimum early start. Shepard requested that the crew be awakened at ground elapsed time of 129 hours, which would be about 11:30 central standard time, 11:30 p. m. This is about an hour and 25 minutes ahead of the normal wake up time and could conceivably move the EVA up by that amount, however, Flight Director, Milt Windler said he did not expect that the EVA would move up by a full hour and 25 minutes. However, it's difficult to predict precisely how the time line will move tomorrow and about all that can be said at this point is that it will probably be somewhere between 30 minutes to an hour and a half early. We have good solid data from the lunar module and all of the LM systems look good at this time. At 123 hours, 15 minutes, this is Apollo Control, Houston.

PAO This is Apollo Control at 123 hours, 59 minutes. We've reacquired the Command Module, Kitty Hawk on its 22 revolution of the moon. And at the present time the spacecraft is in an orbit of 58 by 61 nautical miles. All crewmen are asleep at the present time, Roosa in the command module and Mitchell and Shepard in Antares on the Lunar Surface. Roosa went to sleep sometime prior to 122 hours, at which time we reacquired the spacecraft after a backside pass and telemetry data showed Roosa sleeping soundly at that time. And Shepard and Mitchell aboard the lunar module have been asleep since about 122 hours, 30 minutes. Here in the Control Center activities consist primarily of monitoring lunar module systems and also looking at data on the command module when we are in acquisition. Flight controllers reviewing procedures for tomorrow's activities and primarily the LM liftoff. And its relatively quite period as one might expect at this time in Mission Control. At 124 hours, 1 minute, this is Apollo Control, Houston, standing by.

END OF TAPE

PAO This is Apollo Control, Houston, at 124 hours 47 minutes, and we're in the midst of a shift handover here in Mission Control. The maroon team of flight controllers, headed by Flight Director, Milton Wendler, will be going off shift in about 20 minutes. And at the present time all 3 astronauts are asleep. We said good night to Stu Roosa aboard the command module at about 120 hours 45 minutes, and at 122 hours 20 minutes, Al Shepard and Ed Mitchell aboard Antares on the moons surface reported that they were going to begin their rest period. Shepard reported prior to turning off the communication circuit that the crew was in excellent condition and he requested at least a 30 minute extension to the EVA tomorrow, and he asked that he be awakened at 129 hours. The normal wake up time for the crew would be 130 hours 25 minutes. The extra hour and 25 minutes to allow for preparation for the EVA and an early start on the extravehicular activity. During the EVA debriefing, prior to the sleep period we advised Shepard and Mitchell that the ALSEP signal strength appeared lower than expected. The crew reported they did not believe the central station antenna had been moved, and we do not have an explaination at the present time for the low signal strength. In mission control the primary activity for the past couple of hours has been to monitor the status of all of the space craft systems both on Antares and Kitty Hawk while the command module is in acquisition, and we have about 20 minutes of acquisition time remaining before Kitty Hawk goes around the corner on the 22 revolution of the moon. We're showing 4 hours and 10 minutes until the crew is scheduled to be awakened to begin preperations for the 2nd extra vehicular activity. At this time in the MSC news center main auditorium, Doctor David W. Strangway, Chief of the Geophysics branch at the Manned Spacecraft Center, will meet with newsmen to answer questions on scientific results of the first EVA today. At 124 hours 50 minutes this is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control at 125 hours 10 minutes ground elapsed time, we've now had loss of signal from the command module as it passed by on the moon toward the end of the 22nd lunar revolution. Command module pilot Stu Roosa is still apparently asleep at this time. The countdown clock for wake up of the lunar module crew now showing 3 hours 49 minutes of sleep remaining until the alarm clock goes off. Handover in progress here between the maroon team of flight controllers headed up by Milton Windler with the gold team taking over. At 125 hours, 11 minutes ground elapsed time, this is Apollo Control.

PAO This is Apollo Control 126 hours, 51 minutes ground elapsed time. Some 2 hours, 8 minutes remaining until wakeup time for the lunar module crew, Shepard and Mitchell who apparently corked off to sleep within about ten minutes after they made their last voice contact with the Control Center. The lunar module crew, Antares, will wake up at about 129 hours ground elapsed time instead of the flight plan time of 130 hours, 25 minutes. Roosa and Kitty Hawk will awaken at about 129 50 which is the flight plan time to begin his day's work in orbital science experiments. With the early wakeup time for the lunar module crew it appears at this time that the EVA-2 may be moved up if provided they are ready. The decision has not been made of course to begin EVA an hour earlier but if they're ready at that time the flight plan people, the flight activities officer sees no reason right now why they shouldn't go EVA an hour earlier. The EVA would be extended about a half hour from 4 hours 15 minutes on the flight plan to about 4 hours, 45 minutes. Meanwhile, outside the lunar module where the Apollo lunar surface experiment package implaced earlier during EVA-1 by Shepard and Mitchell, the radioisotope thermal electric generator, RTG is supplying the electric power to the experiments. The RTG is now delivering 71 watts to the instruments, all of which are functioning normally and sending a stream of data to the science staff support room here in Mission Control Center. And another related experiment, although not really part of ALSEP, the so called LR cubed or laser retroranging reflector laid on the surface aimed back towards earth by Shepard and Mitchell. We have report that at 7:15 central time tonight the McDonnell Observatory which is part of the University of Texas Department of Astronomy located at atop mountain lock in the Davis Mountains in far west Texas had a lock on with the LR cubed with a laser fired through the 107 inch reflector telescope. The Kitty Hawk is presently about 2/3s of the way across on rev 23 frontside pass, some thirteen minutes remaining. Roosa still apparently asleep according to the flight surgeon.

PAO As a matter of fact he said he was quite sound asleep. The orbital size for Kitty Hawk is 60.8 nautical miles by 58.8 nautical miles. Flight Director Gerry Griffin has just completed a leisurly check with all the console positions here and things upcoming during rather quite shift tonight. And at 126 hours, 55 minutes ground elapsed time, this is Apollo Control.

END OF TAPE

ANTARES Houston, Antares.

CAPCOM Antares, Houston. Over.

ANTARES Roger. Good morning. Good morning. Reading you loud and clear. How me?

PAO This is Apollo Control. Antares is calling Mission Control. We'll continue to stay up live.

ANTARES Loud and clear, Fredo. How do you read us?

CAPCOM You're loud and clear, Al. Good morning. We had a little mixup on whether we're Configured properly or not. I guess we are. You're loud and clear.

ANTARES Okay. We're up and running this morning. We're assuming we have a stay for EVA-2 and our crew status this point is we've had no medication.

CAPCOM Roger, Al.

ANTARES We've had no medication and the shape of the crew is excellent. The CRD reading is as before, commander 16051 and LMP 07049.

CAPCOM Roger. Copy that.

ANTARES And any time you want to give us the liftoff update and the consumables update we're ready to go.

CAPCOM Okay. I haven't got that ready to go yet, Al. I'll call you when I do.

CAPCOM Antares, Houston. I have the consumables numbers for you. Over.

ANTARES Okay. Go ahead.

CAPCOM For a g.e.t. of 129:00, RCS A 80 percent, B 77 percent, descent 02 is 66.7 percent and ascent N/A and slash 96 percent, descent water 40.7 percent, and ascent is 98.4/98.4 percent. The - stand by one on the last. The amp hours on the descent DAPS are 834 and on the ascent DAPS they're 572. Over.

ANTARES Okay. I copy g.e.t. of 129:00, RCS of 80 and 77, 02 descent oxygen 66.7, ascent is NA and 96, descent water 40.7, ascent water is 98.4/98.4, ampere hours remaining descent is 834, ascent is 572.

CAPCOM Readback is correct, Ed. Good morning.

ANTARES Good morning, Gordon. How is it back in Houston this morning?

CAPCOM I'm not sure, Ed. I haven't been outside in quite a while. But we're wondering if you'd give us an estimate of your sleep there.

ANTARES Well not very much. I slept 4-1/2 to 5 hours at the most. Just kind of dozing most of the time.

ANTARES And about 4 hours for the CDR.

CAPCOM Roger.

CAPCOM Antares, we still are showing the

CAPCOM water separator speed offscale high and one question they maybe can resolve the reason, on the lithium hydroxide canister we'd like to know if the flow limiters are on those - on both the one you took out a short time ago and the one that you put in. Did you happen to notice?

ANTARES That's affirmative. We had the set box flow limited on both.

CAPCOM Roger, Al.

ANTARES Okay, Houston. I'm changing back to power primary and (garbled).

CAPCOM Ed, you were cut out there by another conversation. Will you say again please?

ANTARES Roger. I'm going to primary power amp back to primary (garbled).

CAPCOM Roger, Ed.

CAPCOM We'd like you to stay in - -

ANTARES Houston, Antares. How do you read?

CAPCOM Loud and clear, Ed.

ANTARES Okay. There you are. We're ready to proceed with the IMU alignment when ready.

CAPCOM Check. Just one second.

CAPCOM Antares, Houston.

ANTARES Go ahead.

CAPCOM We'd like you to hold off for about 5 minutes on that until we can give you an uplink and that will result in a much better alignment. Over.

ANTARES Okay.

ANTARES Roger. Houston, we better get the computer up and I'm ready for you here. Can we press on with that?

CAPCOM That's affirmative, Ed. Go ahead.

CAPCOM Antares, Houston.

ANTARES Go ahead.

CAPCOM We'd - we're seeing a fluctuating signal strength. Like to verify that your at primary power amp and on the erectable. Is that correct?

ANTARES That's affirmative. But let me check. Just a second.

ANTARES Antares, Houston. How do you read now?

CAPCOM Roger. Loud and clear.

ANTARES Okay. Now I went from secondary to primary. I never got past off on the power amp.

CAPCOM Roger, Ed.

ANTARES Houston, we're at POO and data. Standing by your uplink.

CAPCOM Roger.

CAPCOM Antares, Houston. We're starting your uplink now.

ANTARES Okay.

END OF TAPE

CAPCOM Antares, Houston. The computer is yours and you're clear to do the P57 any time.

ANTARES Okey-doke. Thank you, Gordon.

CAPCOM Antares, Houston. I have the NOUN 34 number for you when you're ready for it.

ANTARES Okay, Houston. I assume you mean the liftoff table. Go ahead.

CAPCOM Negative. I meant the time you need about 3 steps more of P57, rev 31, less that time. I do have the table if you want that one first too.

ANTARES Oh, okay. Right now. Go ahead and give this one.

CAPCOM Okay. The one for the P57 rev 31 liftoff, 142, 25, 3382. Over.

ANTARES Roger. 142, 25, 3382.

CAPCOM That's right. And any time you get a chance I'll give you the table.

ANTARES Okay, Houston. Are you ready for VERB 74?

CAPCOM Stand by.

ANTARES Okay. Here it comes.

CAPCOM No. Not yet, Al.

ANTARES Okay. I'll stand by. Do it again when you're ready.

ANTARES And I'm ready to copy the liftoff table.

CAPCOM Okay, Ed. Start at rev 26, liftoff at 132:36:23, 27 is 134:34:42, 28, 136:33:03, 29, 138:31:25, rev 30, 140:29:46, 31 is 142:28:07.

ANTARES Okay. 26 is 132:36:23, 27, 134:34:42, 28, 136:33:03, 29, L38:31:25, 30, 140:29:46, 31, 142;28:07.

CAPCOM That's all correct, Ed.

CAPCOM Al, this is Houston. I guess we got that fitst VERB 74 you gave us so we won't need another one.

ANTARES Okay. Very good. We'll press on with P57.

CAPCOM Roger.

CAPCOM Antares, Houston.

ANTARES Go ahead.

CAPCOM Couple of items. When you get to the point where you're cleaning and lubricating the PGA neckrings, wristrings and so forth, we'd like to emphasize to you to take special care, especially with Ed's suit. Have you been briefed on the leak problem on Ed's suit?

ANTARES We talked about it a little bit, but not in detail.

CAPCOM Okay - -

ANTARES Let us finish this P57 and then we'll talk about it, Gordon.

CAPCOM Okay. Fine.

CAPCOM Antares, Houston. When you get a chance there, give us downvoice backup. We need to get you in that configuration before Stu comes around the horn here in about 3 minutes.

ANTARES You have it.

ANTARES Houston, you have downvoice backup.

CAPCOM Roger.

ANTARES Houston, Antares. How do you read?

CAPCOM Good morning, Antares. Or good evening. How are you doing?

ANTARES Pretty good. How are you?

CAPCOM Real good. What can we do for you, Ed?

ANTARES We were supposed to be picking up a pre-EVA-2 briefing. We're standing by.

CAPCOM Okay. We're working on it back here, Ed. And we'll be with you here shortly. Tentively, I think they're planning - -

ANTARES Okay.

CAPCOM Okay. Tentively, I think we're planning on towards the end of your EVA 2 prior to ingress you can be thinking about this of going back and taking a look at the ALSEP antenna but other than that at the moment there looks like there are no major changes. We'll get to you shortly.

ANTARES Okay, Geno-O. How are things going there?

CAPCOM Real good. You guys did a super outstanding job yesterday. And I'll tell you you took two of us with you on every step.

ANTARES Gene, if we are going to realign the antenna I think we ought to do it at the start of the EVA.

CAPCOM Okay. We'll make that input. You got any more comments concerning that, Al. Would you - you'd rather get it at the beginning. Is that correct?

ANTARES That's correct. I think if we have to do it at all, then we'll go ahead and get it done right away because Ed can be doing something else while I'm doing that.

CAPCOM Okay. I'll make that input directly.

CAPCOM Antares, Houston.

ANTARES Go ahead.

CAPCOM Okay, Al. We're just taking an overall look at your comm signal strengths and what have you, and - -

ANTARES Go ahead, Houston.

CAPCOM How are you reading?

ANTARES We read you loud and clear.

CAPCOM Okay, Ed. We - or Al, we're taking

CAPCOM a look at your overall comm, matching signal strengths and what have you. We're interested in what power amp you're using right now. What's the position of your transmitter receiver and what antenna you're on now. We'd also like you to give us what those positions were during your sleep period, if you remember.

ANTARES Okay, Gene-O. We're on primary primary downvoice backup and the only difference is we were on secondary downvoice backup I believe. Yes. We went on secondary transmitter receiver. It called for secondary power amp and we were on downvoice backup and we've just gone to primary transmitter receiver as per checklist and primary power amp a few minutes ago.

CAPCOM Okay. And you've been on the EVA antennas the whole time.

ANTARES That's affirmative.

CAPCOM Okay. Thank you.

ANTARES Let's see if what I'm telling you - let's see if what I'm telling you is correct. Let me flip back here.

ANTARES Okay, Gene. I was wrong on that. We went to off on the power amplifier as per checklist. We went to downvoice backup during the sleep period and we came back up to primary as per checklist this morning. I was thinking that we were in secondary but we didn't go by the checklist so it had to be off.

CAPCOM Okay, Ed. We got that now. And we'd like you to switch your water set in at number 2 position, if you would please.

ANTARES Okay. Stand by.

END OF TAPE

ANTARES Houston, Antares.
CAPCOM Go ahead.
ANTARES Okay. We're ready to start our timer up on the EVA-2 prep.
CAPCOM Okay. And we're pushing to get an answer on this briefing real quick here. I understand you're ready to push your timer up on EVA-2 prep.
ANTARES That's affirm.
ANTARES And we don't - we can get that answer any time, Gene. When we go out the door even.
CAPCOM Yes. That's affirm. We're with you for pressing on at this time. How is your neckrings and wristrings look. Were they pretty bad shape dirt and dust wise.
ANTARES I don't think they were. My right wristring was a little bit dirty. The neckring didn't look bad. The left one wasn't bad. Al's are in pretty good shape.
ANTARES Yes. It was kind of a surprise to me. No visible grit to speak of at all.
ANTARES Okay. MARK to start timing.
CAPCOM Okay.
PAO This is Apollo Control, 131 - 30 hours 21 minutes ground elapsed time. It appears here in MIssion Control that EVA-2 will begin within about an hour or hour and 15 minutes from now. Somewhat ahead of the nominal time line. The crew in Antares are proceeding at this time with EVA preparations. And we'll follow the conversation between the ground and the lunar module as these preparations continue. Cabin depress had been scheduled at about 134:10. It looks like it might be around 131:30 or thereabouts. That time will be firmed up as the planners get all their thoughts lined up. At 130 hours 22 minutes and we're air to ground with Antares still open, this is Apollo Control.
ANTARES Houston, Antares.
CAPCOM Antares, Houston. Go ahead.
ANTARES Just to keep you advised, we're starting PLSS donning on EVA-2 prep.
CAPCOM Okay, Al.
ANTARES Houston, Antares.
CAPCOM Go ahead, Antares.
ANTARES Okay, Fredo. We're at the PLSS comm check portion of our preping mode. We will follow checklist except we will reverse the LMP and the CDR audio panel like we did yesterday.
CAPCOM Okay. And Ed we're going to have to hold for about 3 minutes to make the checks here because we need to do some reconfiguring.
ANTARES Okay. Give us a call when you're ready.

CAPCOM And Antares, Houston.

ANTARES Go ahead.

CAPCOM Okay. And while we got this little bit of wait time here before you get on the PLSS's all the way, why don't I get you to get your map out and let me give you some changes on the task.

ANTARES Okay. You want the EVA-2 map out, right?

CAPCOM That's affirm.

CAPCOM And you still there, Antares.

ANTARES Affirmative. We're getting the map out now, Fredo.

CAPCOM Okay. I might give you some general comments. I guess the basic change is due to the need to get back out to the ALSEP and verify the antenna orientation. And I'll have some later instructions for you on that one. And in the process of buying that time we're going to need to be back at the LM at about 45 to 50 minutes rather than the nominal 35 to do that job. We're going to have to change in one case - well, actually change what's documented to grab samples at a couple of places along the way.

ANTARES Okay. I thought we were going to try to do the antenna job first, Fredo.

CAPCOM Okay. I guess the rationale, Ed, was that it wasn't really felt that it would save that much time to do it there since yall had been operating in parallel anyway and it alters our nominal plus with respect to the priorities, it's just desired to save that till last in case we have to cut any more.

ANTARES Okay. Are you getting anything at al with the ALSEP now?

CAPCOM I guess there's a sig - they are getting signals but they're low signals right now and the only things that's going to help is if indeed an antenna lead or something physically jarred the central station so the antenna is offset from the way you left it.

ANTARES Okay.

CAPCOM They've already tried the switching on all the electronics ahead.

ANTARES Okay. We're ready to interface the changes for EVA-2.

CAPCOM Okay. At site B, that'll be a grab sample at that stop. Okay. At site F - -

ANTARES Okay. I've got a grab - Hold it. Fredo, we got a grab sample at site B now. Let's get straight on our term grab sample. You want no photography at all. Is that affirmative? Or do you want some.

CAPCOM The photography there will be the pin, Ed. And that'll be it.

ANTARES Okay. No documentation of the sample at all.

CAPCOM That's affirm.

ANTARES Okay. Press on.

CAPCOM Okay. Now down to Weird. The same thing there. Grab sample.

ANTARES Okay. Grab sample at Weird.

CAPCOM Okay. And then basically I've written in here, it's actually what should be on your closeout part of the comm checklist, but at that time the CDR will go to the ALSEP and I'll have some instructions that follow on that, Al. And at that point, Ed would proceed to the boulder field that's north to take care of the weighbags with documented samples from that area.

ANTARES Okay. I get the ALSEP back and Ed gets the boulders.

CAPCOM Okay. And that's about it. With respect to the nominal time line.

ANTARES Okay. That's simple enough.

ANTARES How many of those big boulders do you want, Fred?

CAPCOM How many can you fit into the weighbags?

ANTARES About - -

CAPCOM Don't fit more than 10 pounds in that 1 pound bag.

ANTARES Yes, Fred. We'll have Al bring them back like a baby in his arms.

ANTARES We'll have to pick up the LM and carry it over there.

CAPCOM How much you been eating lately, Ed?

ANTARES They're not really too bad. They're probably no more than 3 or 4 feet maximum dimension.

CAPCOM Okay. In about 1 minute Kitty Hawk will be going around the corner and we won't have our configuration problem and we'll be able to proceed after that with the comm check.

ANTARES Okay. We're standing by and setting up for it now.

CAPCOM Roger, Al.

END OF TAPE

CAPCOM And Antares, Houston. We're ready for the COM checks. One other item I did neglect since it wasn't on the map task, at your closeout we're also deleting the organic sample.

ANTARES Okay. You'll have to remind us about it, Fred, it's on our checklist.

CAPCOM Okay, sure will.

CAPCOM And Antares, Houston, we'd like normal voice.

CAPCOM Antares, Houston. Hello, Antares, Houston.

ANTARES Houston, Antares. How do you read now?

CAPCOM I read you loud and clear, Antares. We need you to go back to p.m. and go from down voice backup to normal voice and then start in again with the SM route.

ANTARES Okay, I'm in PM now, I'll switch to down voice backup and back to voice.

CAPCOM Okay, switch to down voice and then back to voice, good.

ANTARES Houston, how do you read now?

CAPCOM Loud and clear Antares.

ANTARES Okay, I'm going to fm and close the td circuit breaker.

CAPCOM Roger.

CAPCOM Okay, Antares, Houston. Had a little bit of background static. Give me another check down.

ANTARES Houston, Antares. How do you read?

CAPCOM Go ahead, Antares. I'm reading you about 3 by 3 now.

ANTARES Okay, I'm on fm the TV is closed. Prime prime okay?

CAPCOM Okay, you're coming in loud and clear now.

ANTARES Okay, we're proceeding with the checklist. Modified that we will relay through the CDR's panels. (garble). Now do you receive? Okay, Houston, I'm switching to secondary now. Secondary transmitter receiver.

CAPCOM Okay, Ed.

ANTARES We're not getting it.

ANTARES Houston, Antares, how do you read?

CAPCOM I read you loud and clear, Antares.

ANTARES Okay, we're proceeding on with the vhf configuration. (garble) for right now. (garble) A recorder ON, vhf antenna to EV - All right, Houston, I'm going to com now to PLSS com.

CAPCOM Roger, Ed.

ANTARES (garble) Okay, they're OFF.

ANTARES Try V. Best VIGO 02. (garble)

ANTARES Ed, I read you loud and clear.

ANTARES Roger. And my PLSS 02 is reading 85 percent.

ANTARES Okay, I go B, you go A.
ANTARES Okay. Now. How do you read?
ANTARES Loud and clear. How do you read?
ANTARES Reading you loud and clear, (garble)
ANTARES Houston, how do you read Ed?
CAPCOM Okay, Ed, I read you loud and clear.
ANTARES Okay, Fred-O. And I have a PLSS O2 quantity of 87 percent.
ANTARES And this is Al, with a PLSS O2 quantity of 85 percent. How do you read?
CAPCOM Roger, Al, we copied the quantity and you're coming in loud and clear.
ANTARES Okay, we're proceeding with final systems check.
ANTARES Hey, we got a CAUTION.
ANTARES Hey, Al, wait a minute we do not. have a caution yet.
ANTARES It'll take a little while in the meantime go ahead and suit to gas a full egress.
ANTARES Okay. Suit gas to full egress.
ANTARES Cabin gas return egress. Suit releif AUTO.
ANTARES Okay, while we're waiting for the caution and warning come turn around and I'll unstow your OPS. O2 actuated if you'll bend forward slightly. There you are your flaps are snapped. (garble) and the actuator is on. (garble) to the RCU. It's connected. And you can put your ALPHA suit disconnect back this way. Disconnect the LM O2 hoses let me get those OFF. It is OFF.
ANTARES That is off.
ANTARES That is OFF. Okay, there's your ECS. Okay connect the OPS O2 hose. Will do. (garble) and locked.
ANTARES Okay the purge valve.
ANTARES Okay, you're locked.
ANTARES (garble) verticle

END OF TAPE

SHEPARD A, A is a verivalve vertical. 0 verticle. Okay, ...

MITCHELL 8, okay.

SHEPARD Active.

MITCHELL S2 OPS 02 actuator. Load. BATS are coming flow. (garble). Okay.

SHEPARD Okay, glycol valve to disconnect, I got it.

MITCHELL Actuator to RCU's gradual valve.

SHEPARD Got that.

MITCHELL Connect 02 hoses. Ouch. Okay.

SHEPARD Okay, connect OPS flip with the blue REV lock.

MITCHELL Okay. Mark, have your purge valve.

SHEPARD Mark and load.

MITCHELL Load. A in lock. A is locked (garble)

SHEPARD Okay, the verivalves vertical.

MITCHELL Vertical.

SHEPARD Verify items prepared for jettison. Do you see a valve cover and bracket? (garble)(garble)

MITCHELL That's right.

SHEPARD Okay, set out the (garble) quarter valve.

MITCHELL Quarter valve is closed.

SHEPARD Okay.

MITCHELL Did you make the set (garble)

SHEPARD Okay, put suit on first leg clear.

MITCHELL Suit on.

SHEPARD First leg clear.

MITCHELL That's right, first leg clear

SHEPARD Okay, ready for your help.

MITCHELL Pull the staff loop.

SHEPARD Get the other snap. This is (garble) Okay.

MITCHELL Okay.

SHEPARD Alright. Okay, I believe that's good.

MITCHELL Okay. Back.

SHEPARD You're locked.

MITCHELL Great.

SHEPARD Facing Z controls?

MITCHELL Yes. 5. Okay, your lead is installed. Check your main bag position.

MITCHELL See if you're pressurized. Okay, can you reach it?

SHEPARD Yeah, I got it.

MITCHELL (garble)

SHEPARD (garble)

MITCHELL The cable's coming out. Take your fett at the back. That's good.

SHEPARD Sounds better. Okay.

MITCHELL It's latched.

SHEPARD Very good.
MITCHELL You want me to look behind, now? You look for the other side. That's for you. There you go, put it down.
SHEPARD Okay, LTG is division as required, open the LTG pump breaker.
MITCHELL Take a shot of cold air and chill down, if you don't mind - cold water.
SHEPARD Now, so you don't have any go ahead until a disconnect the (garble)
MITCHELL Okay.
SHEPARD Okay, go ahead. You'll be putting these hoses in the back here.
MITCHELL You're trying a different mode, why don't you hook it up while you're at it? I'll hold it for you. Go ahead.
SHEPARD Okay, thank you.
MITCHELL That ought to do it.
SHEPARD Okay.
MITCHELL It went. Can't do two things at once. (garble)
SHEPARD Yeah.
MITCHELL Jerk? Didn't feel like it. Okay.
SHEPARD Okay, are you ready?
MITCHELL Okay, LTG pump opening.
SHEPARD Okay. I'll get this.
MITCHELL (garble)
SHEPARD you're out half way. There you're locked.
MITCHELL Okay, very fine. Open visor, align and adjust it.
SHEPARD Mark.
MITCHELL Ready. Push the (garble), I'm going pull it down a little bit more today, this suit - (garble) Okay. Okay, go to connectors 3.
SHEPARD Turn around. Lock, red locked, blue locked.
MITCHELL Perge valve 1.
SHEPARD Perge valve is locked.
MITCHELL Water connector 1.
SHEPARD Water connector is locked.
MITCHELL Arm connector 1.
SHEPARD Arm connector is locked.
MITCHELL Okay. (garble)
SHEPARD Okay, hlmet visor arm adjusted.
MITCHELL Can you verify that?
SHEPARD (garble) okay. 302 connectors.
MITCHELL Okay, 3 02 connectors, verify lock and (garble)

SHEPARD One perge valve.
MITCHELL One perge valve. In and locked up.
SHEPARD Water connector.
MITCHELL Water connector.
SHEPARD And calm connector.
MITCHELL Locked and locked.
SHEPARD Take a look at the EVA circuit breakers.
MITCHELL Okay. Wait a minute, hold it. (garble). Okay, EVA circuit breakers.
SHEPARD Okay, (garble)
MITCHELL (garble) Put down EV closed. Okay.
PAO Shepard, Mitchell, in final phases of their check list. Donning their gloves.
SHEPARD Bring your ring around a little bit. disconnect it and then try.
MITCHELL (garble)
SHEPARD Okay, get off.
MITCHELL Off?
SHEPARD (garble)

END OF TAPE

ANTARES (garbled)
ANTARES That felt good.
ANTARES Just what I needed.
ANTARES Okay. For wrist locks locked.
Both (garbled). Verify PLSS diverter and min.
ANTARES (garbled)
NATARES And PLSS up on.
ANTARES Up on.
CAPCOM Okay. Pressurize A and B to egress.
ANTARES Okay. A and B.
ANTARES A and B to egress.
ANTARES In egress.
ANTARES Okay. Pressure integrity check. Turn you PLSS 02 off. Check the (garbled) 02 flag go.
ANTARES Okay. On. There we go.
ANTARES Ready to tell them? 02 flag off.
ANTARES There's flag B.
PAO 131 hours 44 minutes ground elapsed time continuing in the final phase of the countdown toward egress.
ANTARES (garbled) clear at 3.1.
ANTARES Stand by for clear.
ANTARES Okay.
ANTARES You're on a stay with 3.7.
ANTARES I'm not quite through yet. Okay. There it is.
ANTARES And the 02 flag is clear.
ANTARES Flags clear. My 02 is off.
ANTARES Okay. We're stabilized at 3.7.
ANTARES A and 02 coming off.
ANTARES 3.7 starting the check.
PAO We're standing by for GO for depress. Depressurization, standing by 131 hours 45 minutes ground elapsed time.
ANTARES Okay. There's 40. I have about .22.
ANTARES Okay, Houston. .22 drop on the LMP and .15 drop on the CDR. Okay. PLSS 02 on.
CAPCOM Okay. We copy.
ANTARES Okay. PLSS 02 is on. And 02 flight clear on and off.
ANTARES Okay. And the perssure is back up to 3.7.
ANTARES Okay.
ANTARES And Houston, we're ready for cabin depress.
CAPCOM Okay. We're GO, Ed.
ANTARES Okay.
ANTARES Okay. Okay. Circuit breaker ACS cabin repress open.

ANTARES Cabin repress breakers open.
ANTARES And cabin repress valve closed.
ANTARES It's closed.
ANTARES Okay. I'll get the - -
ANTARES Forward or overhead?
ANTARES I'll get the forward.
ANTARES Okay.
ANTARES Okay. Going down.
ANTARES Okay. We're going on our drop. Go to AUTO at 3.5.
ANTARES Cooling down.
ANTARES (garbled) 4.5. 435. Okay. We're back in AUTO.
ANTARES Pump gage is reading 4.9.
ANTARES And so is mine.
ANTARES Okay.
ANTARES Okay.
ANTARES Cabin at 3.5.
ANTARES That's verified.
ANTARES LM suit 3.6 to 4.3.
ANTARES It's at 4.5.
ANTARES (garbled) is reading (garbled) and it's going down.
ANTARES And mine's coming down.
ANTARES Okay.
ANTARES (garbled) Okay, Houston. Time zero MARK.
CAPCOM Okay. We got start.
ANTARES We have zero.
ANTARES We have cabin open.
ANTARES It's at 2 pounds.
ANTARES Okay.
ANTARES One pound, four-tenths.
ANTARES Okay.
PAO Cabin depress going very well. Almost completed at this point.
ANTARES (garbled)
ANTARES Okay. PLSS feedwater on. PLSS feedwater on.
ANTARES Do it again (garbled)
ANTARES (garbled) feedwater on.
ANTARES Okay. Thank you for me.
ANTARES Okay.
ANTARES Okay. Get a water flag A.
ANTARES And mine is cleared.
ANTARES Already cleared?
ANTARES Yes. We used them yesterday. It shouldn't take too long.

ANTARES Okay. There's 3 amps in EPS light. Better - -

ANTARES That component light is on. Fix the lighting to be enuciated in very dim position. And I'll start DET.

ANTARES Okay.

ANTARES You know, I think that deal with my suit problem is (garbled).

ANTARES I've got a broken cable in my wrist.

ANTARES Really?

ANTARES Yes. I can't control the right hand.

ANTARES (garbled)

ANTARES Forward back to the inflight OMNI.

ANTARES Can forward do it.

ANTARES BAck and forward, but I can't turn it this way and make it stay there. It's doing it right now.

ANTARES Okay. We have both water bags clear. Hatch is coming open.

ANTARES Roger, Al.

ANTARES Okay. And you want to get my antenna on the way out.

ANTARES Okay. Watch the hatch cover. Kick it closed with your knee. I mean the handle cover.

ANTARES Okay.

ANTARES Okay. You're going to have to lean toward me. You hung up on the purse. There you go.

ANTARES Coming over your way.

ANTARES Okay.

ANTARES Okay. Now hold it while I get your hatch - get your antenna.

ANTARES Okay. You're go. (garbled).

ANTARES Back straight over there. Now you're in good shape.

ANTARES Okay, Houston. Al is on the porch.

CAPCOM Roger, Al.

ANTARES Okay. I'm ready for (garbled)

ANTARES Okay. Let me get my checklist open here.

ANTARES Okay. Got it.

ANTARES And it's clear.

ANTARES Okay.

END OF TAPE

MITCHELL (garbled) I'll come down and get it outside.
MITCHELL Just hand it to me unless you -
SHEPARD Okay
PAO We're 131 hours 56 minutes. The report from Ed Mitchell on the calbe on his wrist, this is the cable that holds the wrist glove, it's the right wrist. We did not expect at this point for it to inhibit his mobility to any appreciable extent. Continuing in the final phases prior to EGRESS. This is Apollo Control Houston.
SHEPARD Houston, Al's on the surface.
CAPCOM Roger, Al. And, we got a good picture here, and we saw you hop off.
SHEPARD Okay.
MITCHELL And the LEP, ETB ready to come down.
PAO Shepard now on the surface, you heard him talking to Fred Haise, our CAPCOM for this EVA who almost made this trip himself.
SHEPARD ETB coming down.
SHEPARD (garbled) just a sec.
SHEPARD Okay. I've got it.
SHEPARD Let it go.
MITCHELL I'm checking the circuit breakers.
MITCHELL Okay. Houston, I'm ready to EGRESS. Houston.
CAPCOM Roger, Ed. You're clear to come out.
MITCHELL Okay.
PAO The pull cart or MET now in our picture. Shepard moving it over.
MITCHELL Just a minute, I am on the porch.
CAPCOM Roger, Ed.
PAO Mitchell's reporting he's on the porch.
MITCHELL And, down the latter.
PAO Coming down the latter now.
MITCHELL It's nice to be out in the sunny day again.
SHEPARD Yes, it's a beautiful day here in Fra Mauro base.
CAPCOM The Sun ought to be a little higher today.
SHEPARD Yep, going on oxygen today.
PAO That cheery report from Al Shepard.
MITCHELL Okay.
SHEPARD Ed, I started to get a picture of home sweet home right straight up there.
MITCHELL Yep. Could you undo my EVA antenna, please.
SHEPARD Okay. Okay, you're now undone.
MITCHELL Okay. I've been undone before.
SHEPARD Anywhere like this.

END OF TAPE

ANTARES Al.
ANTARES Yeh.
ANTARES One more problem here. My gold visor caught. I can't seem to pull it down.
ANTARES Okay.
ANTARES In there. Thank you.
ANTARES Want some help?
ANTARES I got it okay.
ANTARES All righty.
ANTARES Okay, we're set.
ANTARES (garble) right up here.
ANTARES Okay.
ANTARES That's going to fit Okay.
PAO We're 15 minutes since cabin depress.
ANTARES Watch your foot.
ANTARES Back up.
ANTARES Okay.
ANTARES That's a pretty neat jig, Al.
ANTARES Hey, while you're down there pick up the handle. Okay, very good.
ANTARES Here, do you want to read it?
ANTARES (garble)
ANTARES They sure are heavy. Easy.
ANTARES Do you want the brush?
ANTARES Get a clean little brush out of there.
ANTARES There, it's turned over.
PAO A bit ahead of the time line is Shepard Mitchell loading the MET.
ANTARES Little things proceed to eat your time right up.
CAPCOM Okay, Al and Ed, we've got about 10 minutes left now to complete the MET load.
ANTARES Okay, Fred-O it'll be completed easy in that time.
CAPCOM Very good. We're going to need all we can get.
ANTARES Okay. In accordance with your desires, we're leaving the organic sample out of (garble) number 2. Is that correct?
ANTARES No. No. That isn't the sample he referred to, I don't believe that one's underneath the LM.
ANTARES Standby, Al.
ANTARES Do you read Houston.
CAPCOM Okay our (garble) is continue as nominal.
ANTARES Okay.
ANTARES I'm just going to jerk that cable out yet.
ANTARES Okay, let's run over the MET stowage where we have the (garble). Extension handles and two pairs of tongs. Okay we have two core tube cap assemblies. We have a (garble) We have a handle we have a small scoop 6 core tubes. 35 bags dispenser, trenching tool. A 16 mm camera and - may I have that last brush again please?

END OF TAPE

PAO Shepard reading out his MET loading list.

SHEPARD Okay, we can load up a magazine right here if we want.

MITCHELL Okay, to wait a minute.

MITCHELL There you got it.

SHEPARD Houston, on the 16 mm we're putting magazine hotel hotel.

CAPCOM Roger, Al. Hotel hotel.

SHEPARD Dump you there.

MITCHELL I'm getting up.

SHEPARD We out het?

MITCHELL Yeh, there's some more in there.

MITCHELL Houston, on the 16 mm mags I put foxtrot foxtrot, g g george george on the MET storage.

CAPCOM Roger, Ed.

MITCHELL I'm putting Hasselblad kilo kilo.

MITCHELL Above the MET storage area.

CAPCOM Roger. Kilo kilo Hasselbald mags.

PAO Twenty five minutes now since cabin depressed.

MITCHELL I have the close-up camera turned on.

MITCHELL Got all the mags.

SHEPARD There's one more Hasselblad back there.

SHEPARD Okay, after - 16 mm going in here.

SHEPARD Okay we have 16 mm camera and two in house magazines two FESC's and MFSC 2 70-mm cameras and one extra magazine black and white and we have a partial magazine of color. Close-up cameras turned on and we need some more weigh bags.

MITCHELL Have you gotten the polarizing filter and the TDS yet, Al?

SHEPARD The polarizing filter is on the end and the TDS I'll be getting now.

MITCHELL Okay. It looks like the MET stowage is complete by my list, (garble) 70-mm mags -

SHEPARD Negative, we need some more weight bags.

CAPCOM Rog, Al and Ed. I show you short the weight bags mesa brush and the maps.

MITCHELL Okay, the mesa brush is there and the map is there.

CAPCOM Roger.

MITCHELL Okay, boots on.

MITCHELL Okay TDS sample is on.

MITCHELL Okay. And we need two weigh bag on.

SHEPARD That all the weigh bags we have there.

MITCHELL Pardon.

SHEPARD That all the weigh bags we have there, we have two more in here.

MITCHELL Okay. What were we talking about before?
MITCHELL Why don't we get them stowed on the outside then?
SHEPARD Okay, why don't you put this one on the back.
SHEPARD And I'll put this one down here.
SHEPARD Okay, the MET is loaded, Houston.
CAPCOM Roger, Al, the MET's loaded.
SHEPARD Okay, we'll go to pickup the LPM and then we'll move the television camera after that.
CAPCOM Okay, we're right about on the time line.
MITCHELL Where's the cable for this?
MITCHELL Got it?
SHEPARD Okay. I got it.
MITCHELL That's the cable.
SHEPARD It'll go around the S-band.
PAO Ed Mitchell pulling the MET or pull cart.
MITCHELL Say again.
CAPCOM I said that really looks neat, Ed. I can see it bouncing a little bit and your tracks are quite visible.
MITCHELL (garble)
SHEPARD Okay, up on top of the hill.

END OF TAPE

PAO positioning by the scientific bay for off loading of the magnetometer.

SHEPARD And is very level there.

MITCHELL Okay. The pallets removed, the thermal cover is replaced.

SHEPARD And, do this slow.

SHEPARD Okay.

MITCHELL It's all yours.

SHEPARD Okay.

MITCHELL (garbled) give me a little more slack. up there.

SHEPARD I'm up. Number 1 in the Sun.

MITCHELL Okay.

SHEPARD I got it.

MITCHELL Okay. We'll take off the electronics package. Throw away the caging device.

PAO Mitchell off loading the magnetometer from the science bay.

MITCHELL High scale. On.

SHEPARD (garbled)

MITCHELL Okay. Clear.

MITCHELL Houston, you want LPM on temperature it's 125.

CAPCOM Roger, Ed, 125.

SHEPARD Clear.

MITCHELL Okay.

MITCHELL All right, and the LPM is loaded onboard the MET.

MITCHELL I'll turn on that if you'll turn the camera around.

SHEPARD I just want to get a good direction actually. Our sight to A, directly toward the center of the crater.

MITCHELL Yep, that's right over that way.

SHEPARD And it's, gee, it's 350 meters, a thousand feet.

MITCHELL Yep, we'll start off that direction and take a look around.

SHEPARD Okay, I'll aim the camera towards Cone.

MITCHELL Okay.

SHEPARD Okay, Houston. We're going to try to put the TV camera in the shade and aim it up toward Cone.

PAO The magnotometer now on the MET.

CAPCOM Oh, we don't want to tarry too long on that one we're about 2 minutes behind starting out. And, the settings you can leave them just as they are right now.

SHEPARD Fredo, say again.

CAPCOM Okay. The settings that are on the TV right now are good.

SHEPARD You don't want to aim it toward Cone Crater?

CAPCOM That's affirm, Al. You can do that task but we won't worry to much about fineness on aiming it. The settings on the camera now should be good.

SHEPARD Okay. We'll aim it up toward Cone. It's going to be very close to the Sun.

CAPCOM Roger, Al.

SHEPARD We'll see what happens.

SHEPARD Do you have the image of the Sun yet. Do you have the image of the Sun yet.

CAPCOM Okay. We have a little bit of a glare there, but we have a picture, Al.

SHEPARD I'm going to bring it a little further to the right.

CAPCOM Roger, Al. I think we can see the slopes left flank of Cone coming in.

PAO Pointing in the direction of Cone crater.

SHEPARD Okay, you're looking at Cone

CAPCOM Roger, Al. We have little bit of a glare across the center but in the background we can see the crest of Cone.

SHEPARD Okay. We will probably be off the camera to the right.

PAO That was Shepard moving across the field of view there.

MITCHELL Al, think we can find out where we are.

MITCHELL Okay, while you're checking your position -

END OF TAPE

SHEPARD Okay. While you're checking your position, I'll be using the closeup. Okay. Taking the picture of the MET track, Houston.

CAPCOM Roger, Al.

SHEPARD - - with the closeup and the sun at 11:00 o'clock. Okay, 30 one and two, my track is at 11, 303, and 4, footprints, sun at 10 o'clock.

CAPCOM Roger, Al. I copied the frame numbers. And we still have you in the picture.

SHEPARD Okay. Get on in, then.

MITCHELL I don't know exactly where we are.

SHEPARD Well, keep the map in your hand and keep going. I got this.

MITCHELL Okay. If I can locate a familiar crater.

SHEPARD Okay, Houston. We're headed just about toward the center of Cone Crater.

MITCHELL Okay, Al. Is this north Triplet right here to our right. It is isn't it.

SHEPARD Yes, sir.

MITCHELL Okay. This nice big depression over here.

SHEPARD Houston, we're again proceeding directly toward the center of the crater point A. As Ed pointed out, we're passing north of north Triplet. The area over which we are passing again, of course, is pock marked by craters. However, the land is generally flat right here. We have a sort of a - I was going to say mesa but I really don't think it's a mesa. It's more of a ridge, which extends to the southeast almost normal to our path of travel. I think point A is probably down in that valley.

MITCHELL Yes. Look Al. I've spotted it. See the crater almost directly up front from us, in the valley. Right in the middle valley. I think that's Weird. And if we head to the north of that, we're in business.

SHEPARD Okay. That means that point A is in fact then in the valley.

CAPCOM Roger, Al.

SHEPARD There seem to be quite a few large rocks as we progress along here. The rocks of up to 2 or 3 feet in size and one would fairly easily postulate these came directly from Cone Crater, of course, we will get samples of these a little further along.

MITCHELL A little further to the left.

MITCHELL Okay. Point A, Al, is right in the valley. It's right beyond over here.

SPEPARD Okay. A is very subdued craters now.

MITCHELL Yes.

CAPCOM Is there any basic change in the - -

CAPCOM Any basic change in the surface texture as you're heading out across toward A.

MITCHELL No. It looks all the same, Fredo.

CAPCOM That's what I was afraid of.

MITCHELL Fredo, see the crater - see the crater 60 meters to the west of point A?

CAPCOM Roger, Ed.

MITCHELL The sharp one.

CAPCOM Okay. I think I have it on the chart.

MITCHELL Okay. We're coming up on that one right - Okay. We're coming up on that one right now. It's the sharper one in the east - north-south line of about 3 craters. And our traverse, supposedly, passes right between them. Got it?

CAPCOM Okay. We got you right on the map, Ed.

PAO Heart rates, Shepard 84, Mitchell 90.

MITCHELL Supposedly just south of our track at 71 and CT and CT.3, we're passing exactly on the south rim of those two now.

CAPCOM Roger, Ed.

SHEPARD Probably A right here, is it not?

MITCHELL It's right over here to our left a little bit, Al, I believe. Let me see.

CAPCOM And one other question from here. Did the blocks you described as you moved across there, do they appear to be in the form of rays from Cone or are they pretty widely spread.

PAO Shepard.- -

END OF TAPE

PAO Shepard, Mitchell moving towards their first stop.

SHEPARD They're fairly generally scattered.

MITCHELL They may form a pattern when they get to the top and can look at them in plain view, Fredo.

CAPCOM Very good.

MITCHELL Fred, right in the center of these three vary. Okay.

SHEPARD Far out?

MITCHELL Well, it's pretty close. I don't think it's exactly at A, but it's close.

CAPCOM Okay, I'll clock you at A right now.

MITCHELL Okay, that large crator to you right, Al, just doesn't show up.

SHEPARD Ho, ho.

MITCHELL It does, too, that's the one. Just beyond that is A.

SHEPARD Looks like right about 20 feet ahead of me, right?

MITCHELL Yep, yep.

SHEPARD Okay babe, Fred, the surface, here - talk about that, is textured. It is, of course, a very fine grain dust (garble). About the same as we have in the vacinity of the LM. But, there seems to be small pebbles - more small pebbles here on the surface than we had back around the LM area. And the population of larger rocks perhaps small bolder size is more prevalent here. Okay, this is probably pretty good.

MITCHELL Yeah, this is a good place for A and ya'll might also comment, Fredo, that the - they have an appearance, here, quite often like raindrops or a very few raindrops have splattered the surface. It gives you that appearance. Obviously, they haven't, but it's that sort of textutre in places.

SHEPARD Yeah, I think - I was just about to say that there's a relationship between the texture and these small surface pebbles. Okay, point A.

MITCHELL We're point A. Do a double core LPM. I'll start with the LPM with a pan.

SHEPARD Okay, I'll start with the GDF.

SHEPARD Fred, did you read, we were ...

CAPCOM Roger, I copied all of that.

SHEPARD The point where we are sampling is just about in the center of three crators of almost equal size. I would say, perhaps, 20 meters in diameter. The one to the north is soft, more fresh more sharp the one to the left is more subdued. I'm pretty sure we're just about where point A is on the map, it fits very close - it fits the description of it.

SHEPARD Okay, in the GDF, Houston, serial number, 1002 and the frame counter on the closeup is about AL 305.

CAPCOM Roger, serial number 1002 and 305.

SHEPARD Rog, and I'm now dusting that sample.

SHEPARD Remark before he starts, that number 3 block on this sample, appears to have a smudge on it before I start a very light black smudge.

CAPCOM Okay, we copied, Al.

SHEPARD Okay.

MITCHELL Okay, Fred, the LPM is in place - it's level and alined and I'm returning to the LM.

PAO Mitchell has positioned and leveled the magnatometer.

MITCHELL Okay, I'm here, now.

CAPCOM We're starting the clock.

MITCHELL (garble)

SHEPARD Sure (garbled). What would you like?

MITCHELL I'll take mine, if you don't mind.

SHEPARD Okay, Senor.

MITCHELL No sun, I want F8. Again.

END OF TAPE

MITCHELL And, Houston. We located our shot for the placement of the mat of the LPM in frame 7 magazine MM.
CAPCOM Roger. And, you go with reading.
MITCHELL I'll take 2 of them.
MITCHELL Yes, I took 2 shots of that for your locaters.
CAPCOM Roger, Ed. And, we'll go for the readings.
MITCHELL Okay. Be there in a second.
PAO Ground elapsed time 132 hours 40 minutes. We're 52 minutes since cabin depress.
MITCHELL Huh, Fredo.
CAPCOM Go ahead, Ed.
MITCHELL I'm on high scale X is 9.6 54.2 B 7.3.
CAPCOM Okay. Copy, Ed.
PAO Those are magnetometer readings given by Mitchell.
MITCHELL 6 Y 3.8 B 6.7 X 9.6 Y 3.7 B 6.5.
CAPCOM Okay. I got all - all readings, Ed.
MITCHELL That was the high scale reading.
CAPCOM Roger. The high scale.
SHEPARD And, now verifing the second PDF serial number 1001.
PAO Shepard talking about the thermal degradation sample.
SHEPARD Okay, Fredo. I'm giving the LPM number 2 and -
CAPCOM Okay. Let me know when you're back to commence.
MITCHELL Okay. Just a second. I wanted to tell you that in my leveling of these things the bubble is tangent to the intercircle to the ball, on both the first and the second alignment.
CAPCOM Roger, copy, Ed.
MITCHELL Back at the MET.
CAPCOM Okay, and the clock says starting it.
MITCHELL Okay.
CAPCOM And, while we got a few seconds there, Ed. The raindrop pattern you mentioned is it pretty general or is just a here and there that you noticed this texture.
MITCHELL It seems to be fairly general, Fred.
SHEPARD Okay, Houston, the (garbled). (garbled) is complete in the final counter close up is reading 311.
CAPCOM Roger, Al. I copied on 1001, serial number final count to be 11. And Ed you can go for the reading.
MITCHELL Okay.
SHEPARD Get in there baby. Okay.
MITCHELL Okay, Fredo. On high scale again X 01.1 now hold it, oh, okay. (garbled)
MITCHELL Ttill you turn it on. X 1.1 Y 3.7 B 4.0 X 1.1 Y 3. now.

APOLLO 14 MISSION COMMENTARY, 2/6/71 132:39 GET 413/2

MITCHELL Y is 4.0 B 3.7 X 1.1 Y 3.9 B 3.6. Over.

END OF TAPE

MITCHELL (garble) 3.9 B 3.6. Over.
CAPCOM Okay, Ed. We've got all of your readings.
ANTARES (garble)
SHEPARD Okay, we got close up shots through all 13 and 14 and 12 all at nine o'clock shadow. 12 and 14 and got 2 typical examples of the raindrop picture pattern which Ed - of which he spoke. 13 is a picture of a foot track - foot track in the same area.
CAPCOM Roger, Al.
SHEPARD And I see a fairly large rock here at the - at the north of these three craters. It's imbedded right in the rim. It's about 2 feet long. I can see some ripples in it. It has a good (garble)
PAO With the thermal degradation sample, Shepard was checking the adherence of dust to the kinds of paints to be used on the rover. The rovers start with Apollo 15.
CAPCOM Okay, and Al, a word from the back room, says go at least two crater diameters away from I guess the crater you've just describing when you get ready to take the double (garble)
SHEPARD Okay, we'll try to put it in the center of the three craters to get all three - well to get whatever (garble) we have here and the last (garble) picture shadow nine o'clock was 18.
CAPCOM Roger, Al.
SHEPARD Okay. since we've already taken a couple of pictures of the MET track, I won't do it any more out here and probably won't again unless we see some difference in these tracks.
SHEPARD They're fairly what you might expect because they're smooth, they're well packed and vary in depth only as a function of the - of the surface tensions.
MITCHELL Fred-O, I've left the LTM, I'm returning to the MET. Had a little trouble with it that time. The bubble is tangent on the east side of the center ring.
CAPCOM Okay. On the east side. Let me know when you get there.
SHEPARD I'm at the MET starting the clock.
PAO Each section of the double core to be taken at this site is about 15 inches long.
SHEPARD Okay, all set up for the double core here.
MITCHELL Okay, I'll be with you in a second. I have a pan to take and I'll be right with you.
SHEPARD Be careful with the velcro on the tounge it came off. (garble)
MITCHELL Yeh, I understand.
SHEPARD Why don't we just put (garble)
MITCHELL (garble)

ANTARES (garble)
MITCHELL 16 mm mag.
SHEPARD Okay (garble)
ANTARES Okay, Fred-O, you about ready?
CAPCOM Okay, one minute. Go ahead.
ANTARES Okay, Y, this is high scale. Y is 1.0 I'm sorry X is 1.0, Y is 8.1, Z is 6.6. Next, X is 1.0, Y is 8.1, Z is 6.6. Third set X is 1.0, Y 8.1, Z is 6.65.
CAPCOM Roger, Ed and I assume all those werehigh scale again.
MITCHELL Beg your pardon. Those were all high scale that's affirm.
PAO Third set of magnetometer readings from Mitchell.
SHEPARD Okay the bottom core tube will be number 2. No tab. Top core 2 will be number 3 no tab.
CAPCOM Roger, Al. Top got number 3 no tab, bottom number 2 has no tab.
SHEPARD Correct.

END OF TAPE

PAO The core tube numbers given out by Shepard will be used for later identification of the samples to identify tthe top and bottom tubes. We're at 132 hours 52 minutes ground elapsed time. 1 hour and 4 minutes since cabin depress.

MITCHELL Okay. And the tongs -

CAPCOM And have you started wheeling it up yet, Ed.

MITCHELL I'm starting it right now, Fred.

CAPCOM Good (garbled)

MITCHELL The electronics are in the box and picking up the reel now.

MITCHELL Oh, no. This is a can of worms.

CAPCOM You're having some problem reeling it in, Ed.

MITCHELL Yes. An awful lot of problem with it Fred. (garbled) the cable is so much that if I ever let go of the handle it winds down about 3 or 4 turns on me and I have to release then I have to take it back out. And the cable is all bunched up and curdled out here. I'm not sure I'm going to get it wound or not.

CAPCOM Roger, Ed.

MITCHELL It doesn't matter. I'm holding it.

PAO That's the magnetometer cable Mitchell is talking about.

SHEPARD Okay, Houston. A couple of quick stereos in the locator of the core tube as it's about to be driven and the locale is the LM is in the background.

CAPCOM Roger, Al.

MITCHELL Okay, Fredo. I got the LPM reel reeled in just enough to keep it off the ground. It's really a can of spagetti here.

CAPCOM Okay, Ed.

MITCHELL Al, you haven't taken a pan have you?

SHEPARD Nope.

MITCHELL Okay. I'm starting the pan.

CAPCOM Okay. Just in the way of bookkeeping, we need a double core and the pan and a sample.

MITCHELL Okay.

SHEPARD Okay, Houston. Want to get another one of those tubes complete - tubes here about 1-7/8 I would say.

CAPCOM Roger, Al.

PAO Shepard reporting he has two tubes these are core samples.

MITCHELL Okay, Houston. The pan is completed. I took it from the rim of an old crater with fresh crater right in the bottom of it, several small ones around it.

SHEPARD Yes. That's a pretty blocky one, that new one. I think if we take samples from right along that rim there, you'd probably get some of that from the bottom.

MITCHELL Yes. Okay.

CAPCOM Okay. We copy, Al and Ed.

SHEPARD Okay. And the core bit, just for the fun of it, is going inside 2 November. If we can get it back.

CAPCOM And Al, they'd like a description of the surface where you drove the core tube.

END OF TAPE

SHEPARD Okay, Fred. Nothing but the same textured pattern of which we spoke coming up in this traverse.

MITCHELL Al?

SHEPARD What?

MITCHELL Where's our color chart? Thank you.

SHEPARD Did you read the core tip -

CAPCOM Roger, Al, we got that and for your information that we're about 5 minutes behind in the total timeline, for departing A.

SHEPARD Okay.

SHEPARD Continuing our descripture of the surface. It appears to be a population of very small blocks. Now, (garbled) going to photograph here, and a documented sample. I believe they came from the crater to the north of the sampling sites. Other than that, the (garbled) core samples is very easily site is not unique to the traverse so far. The first core went in very easily we had some (garbled) difficulty with the last core.

CAPCOM Roger, Al.

MITCHELL Okay.

SHEPARD Get that by yourself?

MITCHELL Yep.

PAO 133 hours 3 minutes ground elapsed time. One hour 15 minutes since cabin depress.

MITCHELL Houston, the rock I'm sampling is a ... seems to be a fairly typical one. Of this little crater multiple crater that we're working around near A and is going into the bag 3 November.

CAPCOM Roger, Ed. Copy 3 November.

MITCHELL Oops, it's breaking apart on me as I pick it up. I'll try to get most of the pieces.

CAPCOM Roger, Ed.

CAPCOM And, and we need to move on here to B ... (garbled) before we depart A, we'll need a EMU hack.

MITCHELL Okay. This is Al. EMU reading 3.75. Oxygen is reading 71, I am no flags I'm on mint cooling and I am comfortable.

SHEPARD Al.

MITCHELL Yes.

SHEPARD Can you hand me another baggy.

MITCHELL Okay. Houston I can't get all of this sample in 3N, Al. That's going to be able to go in 3N and the next one. It looked like it was fractured, and when I picked it up it fractured in about 4 pieces.

SHEPARD Okay.

CAPCOM Roger, Ed.

PAO The fractured sample, the documented sample picked up by Ed Mitchell. The crew should be getting ready to move on to the second station here shortly.

SHEPARD Okay. Now, head out the hill to B.

MITCHELL Okay.

CAPCOM Okay. And, we still need a EMU check from Ed.

MITCHELL Okay, Fred. I'll give it to you in a minute.

SHEPARD Can you catch up with me now.

MITCHELL Yes, I'll catch up. Go ahead.

MITCHELL Okay. Al's heading up with the map. On A we go down into a valley, we drop down a barely consistent slope of approximately -

END OF TAPE

SHEPARD fairly consistent slope of approximately 8 to 10 degrees. The texture here again is pretty much the same on the surface. The - basically, those, of course, is the fine material which is now at this particular site, kind of a grayish brown with the light pebbles on the surface making the raindrop - small pebbles on the surface making the raindrop pattern.

MITCHELL And Houston, I'm treading along behind Al now. I'm starting to catch up with him. As I tried to describe for you before the MET tracks make a very smooth pattern in the surface, remenescent of driving a tractor through a plowed field. It smooths it out and makes a very smooth distinct pattern and probably on the order of a quarter of an inch deep, no more.

CAPCOM Roger, Ed.

MITCHELL It leaves gaps every now and then as it bounces.

SHEPARD I think you found B.

MITCHELL Yes, I did. That big crater over here that -

SHEPARD It's way up the hill. I think it's up the hill.

MITCHELL Oh, that's right. B is the crater we go - this is the crater we go by on the way to B.

SHEPARD Roger.

SHEPARD Okay, Houston. I'm looking for contacts somewhere in here, but it's not apparent at this point. Surface texture seems to be very much the same from the standpoint of furrow bearing properties it's still about the ame softness and it still has the same raindrop pattern.

CAPCOM Roger, Al.

MITCHELL Fredo, you wanted an EMU check from me. At at 37 going 67 percent. I'm on min cooling, no flags.

CAPCOM Roger, Ed.

MITCHELL And continuing the description a little bit, Houston. The (garbled) - trying to think of an adequate description or comparison to something we've already seen, but I don't think there is one. Incidently, I see a string of craters down to the south - a string of boulders to the south of us that may prove to be a ray pattern as we come from Cone. And I observe as we get closer to Cone the number of large boulders is increasing. We're going to go past some here in a couple of minutes - about a 20 foot wide fairly fresh crater. The boulders - a dozen of them or so are 4 or 5 feet in diameter.

CAPCOM Roger, Ed.

MITCHELL There's nothing around them.

MITCHELL Okay. Let's see if we can find us - this crater is the one I think, Al, it's halfway between A

MITCHELL and B, isn't it?

SHEPARD Yes. I think so. This little - -

MITCHELL Can you see the boulders off to the side there on that?

SHEPARD I'm sure they will.

SHEPARD I think - -

MITCHELL You should be able to spot that little chain of craters just to the south of it. On the map - is that - if that's where we think we are.

SHEPARD Yes. That little chain of craters right there.

MITCHELL Kind of small.

SHEPARD That will make us right here, huh?

MITCHELL Pardon?

SHEPARD There's no big one to go with it. A sharp one to go with it.

PAO Shepard, Mitchell, describing the terrain on their walk from station A to B.

MITCHELL (garbled) That looks like Weird right up there.

SHEPARD I thought we were about even with Weird right now although you can't see it on the ridge.

MITCHELL That's Weird that big one right over there, Al.

SHEPARD Yes. That's what I said. I think B is that deep crater right there in front ahead of us.

MITCHELL No. I disagree. I think - see that crater right - -

END OF TAPE

SHEPARD ... I think B is that deep crater right there ahead of us, Ed.

MITCHELL No, I disagree. I think - see that crater right over there that we came by, to the south, the big one. I think this is the crater that that's B. I think this boulder field we can see it here if we look real good.

SHEPARD This crater right here.

MITCHELL Yeh.

PAO The area being walked through is a valley.

MITCHELL We have to be considerably past Weird.

SHEPARD We're not even half way to the rim of Cone yet.

CAPCOM (garble) Al and Ed. I don't think you have to worry too much about the exact position of site B. If it appears you're getting close to the general area and that should be good enough on B.

MITCHELL Okay. I think we're very close to it. I think this crater we just went by is probably it but it's very hard to tell, Fred-O. I don't see anything else that might be it unless it's the next crater up. Al, I've spotted it. That next crater up is this one right here.

SHEPARD Which way are you pointing?

MITCHELL Pardon.

SHEPARD Where at.

MITCHELL Right behind you.

MITCHELL That crater is that crater right up there. That crater is the crater over to the left of it.

SHEPARD Where do you think B is?

MITCHELL I think B's the one we just passed. Right there where we were talking.

SHEPARD All right.

MITCHELL Here's a little hot idea. Shoot the little double crater right beside it. Right here. See there's that crater, see there's the little double crater, it's right there in front of you.

SHEPARD Okay, let's grab sample B.

MITCHELL Get sample B.

CAPCOM Okay, and Al and Ed, this is a grab sample at B and we need the panorama and while somebody's doing that we can get our site description.

SHEPARD I'll get a pan, Ed.

MITCHELL Okay.

MITCHELL While Al takes the pan, I'll go ahead and give you a site description. The area here is an area considerably more boulders. A larger boulder field more numerous boulders than we've seen in the past. I've just come into it as we approached B from A. Now to add there were boulders to the north of us, we previously talked of boulders to the north, and I've got to say

MITCHELL they may turn out to be a ray pattern. It looks suspiciously like - like one. However, where we are now, we're about on the edge of the general boulder population lining the flank of Cone Crater. Now they're not too numerous at this point. They're somewhat patchy there's a lot of them buried, half buried a few of the smaller ones sitting on the surface. These boulders are filleted and we'll have to sample that filleted later. The strip is textured the side is very much - appears very much the same as what we've been walking on all along. And about the only difference we could see is probably a larger number of samller craters, I say probably theres a that is unless you really make a population count, you can't tell. A - guessing a larger number of craters probably the secondary's from Cone to perhaps. It's certainly a larger number of boulders lying around. Now most of these boulders are rounded, there are a few angular, there are a few rocks with angulars that's angularities but by enlarge you can see edges that have been chipped off indicating the beginning of a smoothing process. And some of them are far beyond the beginning of smoothing here, they're worn down pretty well and most of the rough edges are where they have fractured and perhaps turned over. Most of them appear to be along fractures of where other rocks are sitting near them that might have once been a part of that boulder.

CAPCOM Roger, Ed. And has Al got the grab sample completed and up?

MITCHELL He's getting it now.

SHEPARD I'm grabbing it now.

SHEPARD (garble)

CAPCOM Okay, and we need the fine count before departing B and right now we're about 15 minutes behind in the time line.

END OF TAPE

MITCHELL Okay, Fredo, we expect that we're going to fall behind you, there's no way we can help it. We'll pick it up later.

CAPCOM Roger.

PAO The grab samples of flight plan changed, the grab sample replacing the documenting sample.

SHEPARD Okay, grab sample from the west rim of Fauro Crator bag 5 november.

MITCHELL (garble) to complete this description. We're standing on a fairly high point - well, not really on a high point, about half way up the slope. To our north and slightly to the west of us seems to be the low point in this area. It's surrounded by a rim that's reminiscent of a very very low crator. The topography doesn't show up on the map, but it indeed is there. About 500 yards to the north and west is the lowest point that I can see in this area.

MITCHELL Can - Okay, you rady to press on?

SHEPARD Yes as soon as I get my handle screwed back on here.

MITCHELL Okay, the next stop is the top of cove. Let's get everything secured for that trip.

CAPCOM Okay, and we'd like the frame count for his part.

SHEPARD You've got a frame count of 34 from Al.

MITCHELL And 29 from Ed.

CAPCOM Roger, 34 and 29.

SHEPARD (garble)

MITCHELL Maybe it was loose. Had to work loose for you.

SHEPARD Yep.

MITCHELL Okay, I've got the MET.

SHEPARD Okay, you want to go first and I'll follow.

MITCHELL Okay. To the top of Cone Crator.

SHEPARD Yeah, and let's - here we're (garble)

MITCHELL Okay.

SHEPARD Put the (garble) almost to the east here and then I'll...

MITCHELL You want it pointed east ana a little to the ...

SHEPARD To this blank up there.

MITCHELL Yeah, I can just barely see the rim of it on the far side of it.

SHEPARD Right, so we probably ought to go directly from flank and I'm up from there.

MITCHELL Okay.

MITCHELL Houston, as we go across here, this ground is - Al probably previously described it, but it's very ungulating. I would suspect that there is not 10 yards at the most between what were once old crators. They are most of them worn down, but the surface is continuously ungulating. There's hardly a level spot anywhere.

CAPCOM Roger, Ed.

MITCHELL As we come on up toward Cone, we're getting to see a lots more varied rocks, bigger rocks.

SHEPARD We're keeping our eyes open for a contact, here, but I guess the sun angle makes it very difficult to see. However, I expect that by the time we get a little closer up to flank you pull it for a while.

MITCHELL Let me shift hands, I'm good.

SHEPARD Okay. By the time we get a little closer up the flank, we might find some kind of a contact. The ridge of Cone Crater to the north is very apparent, as we expected that it would be. It stretches off into the distance and meets with the far horizon.

CAPCOM Roger, Al.

MITCHELL Fred, I'm trying to find something distinctive to say about some of these crators we're going by and it's very hard to do so. They're all smooth walled except the very freshest one, and we're coming by a very fresh one now, which is rubbelly on the - Hey. It may even - that has some pretty good chunks of rubble on the insides. This is about the freshest crator this size we've seen.

SHEPARD That's correct. This is a very fresh crator. It's about - it's clearly about opposite to the crator at stop E. It's a crator about 20 feet in diameter and about 2 meters deep and I'll get a quick -

END OF TAPE

SHEPARD - and about 2 meters deep and I'll get a quick rock from the side.
CAPCOM Roger. (garbled).
SHEPARD I'll just drop down on a knee to pick up a rock to be within of 3 or 4 inches.
MITCHELL Need some help, Al?
SHEPARD Yea, I think so, I can't get (garbled).
MITCHELL Okay. Come on give me your hand.
SHEPARD Wait a minute I got it now. Okay.
MITCHELL Okay. Come on up. Okay.
SHEPARD Thank you.
MITCHELL You're on your feet.
SHEPARD Okay. I took a quick hand sample on the side of that crater.
MITCHELL Do you think your following and know about where we are, Fredo?
CAPCOM Well, (2 talking at once) just past the position of abeam of E, looking about half way between D and E.
ANTARES (garbled)
MITCHELL And we're starting up hill now. (garbled) fairly gentle at this point but it's definitely uphill. Okay Baby.
SHEPARD Okay, I got it.
MITCHELL Almost turned didn't it.
SHEPARD Yea. I grabed samples from the west rim of the crater which is about as blocky as this bag 6.
CAPCOM Roger, Al. Bag 6.
PAO Shepard, Mitchell about 2/3rd's of the way now to Cone crater.
SHEPARD Crater going is still very smooth as far as the area that we're able to pick out. Of course, we're tracing a sort of sinuous course here. Being out of the crater. And, further, to help further locate it, if you can, we're going by, well, fairly fresh craters. I don't think quite as fresh as the one we were just talking about. The east most one is fresher than ... the west most one is the fresher. They're separated about 75 to 100 feet, and they're about 25 to 30 feet across and 5 or 6 feet deep, 5 feet deep I guess. The westmost one that's got small blocks in it. The deep most one is very smooth.
CAPCOM Roger, Ed. And, you described the blocks now (garbled) by that I assume you (garbled).
MITCHELL I'm not sure that's quite true, Fred. Some of it looked like stuff that belongsd there, and not fallen there.
SHEPARD Saw the glass in that rock, Ed.
MITCHELL Yes.
MITCHELL Oh, there sure is. It looked like some of that so called rubble, looked like it might be the residual

MITCHELL of an impact just lying in the bottom. And, Houston, we're passing a rock much too big to pick up. There's a whale of a lot of glass in it.

CAPCOM Roger. About how big is it?

MITCHELL It's about foot and a half, 2 footer, yeah about a foot and a half across.

CAPCOM Roger, Ed, and we copy the glass.

MITCHELL - Fred.

MITCHELL And, I'm going on medium cooling for a minute.

CAPCOM Okay. And, Al and Ed why don't we take a little rest here for a minute, and we'd like another camera count too.

MITCHELL Like a what? We haven't taken any pictures since the last one I don't think.

CAPCOM Okay, Ed.

MITCHELL Okay. We'll slow down the traverse here. Okay.

SHEPARD Should be flank right here, Ed.

MITCHELL Pardon.

SHEPARD Should be flank right over here.

MITCHELL That's out of sight, you mean.

SHEPARD Yea, right there.

MITCHELL Let's go, let's go over and see.

CAPCOM Okay. Al and Ed, I assume you're on the move now and heading toward Flank, is that correct?

MITCHELL That's correct.

MITCHELL That's correct. Heading toward where we think Flank is. I'll pull for a while, Al.

SHEPARD That's okay. I got it for a while.

END OF TAPE

PAO Shepard pulling the MET at this time.

MITCHELL Why don't we pull up beside this big crater.

SHEPARD Okay.

MITCHELL Take a break, get the map and see if we can find out exactly where we are. Press on from there. This should be distinctive enough.

CAPCOM And Al and Ed, while you're stopped here, we could use a photo pan.

MITCHELL Yes. Don't forget that. If you'll take the pan, Al, I'll grab the map and get over here and see if we can find - -

SHEPARD Okay. You pull it up on a little more level ground.

MITCHELL Okay.

SHEPARD Give you a push.

SHEPARD Okay (garbled).

MITCHELL That looks good.

MITCHELL That old LM looks like it's got a flat over there, the way it's leaning.

CAPCOM Say that last again, Ed.

MITCHELL Just talking. Nevermind.

CAPCOM And Ed, now we're going to have a slight handover here.

SHEPARD Okay, Houston. The pan is complete on magazine - magazine lema lema. Frame count is 57.

CAPCOM Roger. 57, Al.

SHEPARD How you bringing up, Fred.

CAPCOM Copied 57. How's that?

SHEPARD Say again. Ed, do you read them?

MITCHELL Yes. I read.

CAPCOM Ed, do you read, Houston.

MITCHELL (garbled) I know you're breaking up completely. Okay.

SHEPARD Want to start on up toward the rim?

MITCHELL Yes. Just one second though. I think I got it. I'll head on, Al. Fredo, can you read?

CAPCOM Go ahead, Ed.

MITCHELL Boy, I'm getting a feedback on (garbled)

SHEPARD Okay. Ed, I'm coming through.

MITCHELL Okay. (garbled) I can't really spot this crater, but I think I know where we are. We're pretty close to where (garbled) said we were.

SHEPARD Houston, your transmissions are still unreadable.

CAPCOM Roger, Al. I haven't been talking. How do you read me now.

SHEPARD (garbled)

MITCHELL I think it's dead ahead of you, Al. Oh, wait a minute. This is probably it right here. Yes.

SHEPARD Am I right?

MITCHELL Yes. Let's just double check and see.

SHEPARD It's about a 4 meter, biggest crater in the south wall.

MITCHELL That had to be it.

SHEPARD Okay, Houston. We're going by Flank on the way up. We're passing to the north side of it.

CAPCOM Roger, Al. Copy.

SHEPARD Fred, you're still unreadable.

MITCHELL Let me pull a while, Al. You're having all the fun.

PAO Both Shepard and Mitchell heart rates going up to about 120 while they were travelling uphill.

MITCHELL Putting the map away.

SHEPARD Okay.

MITCHELL Finish putting the map away.

SHEPARD All right.

PAO With the higher rates this occassioned the rest stop.

END OF TAPE

PAO With the higher rates this occassion to the rest stop. We're at 100 - -

SHEPARD Okay.

PAO We're at 133 hours 34 mintues ground elapsed time.

MITCHELL Fredo - you back with us, Fredo.

CAPCOM Okay. I'll try again. How do you read, Ed?

MITCHELL Okay. That's much better. You got a background squeel.

CAPCOM Okay. Evidentally, that station switch gave us some problem.

CAPCOM I've been copying both of you all the way though. We have you now just past the point.

CAPCOM Okay. We've been copying you most of the time and I have you by a point now.

MITCHELL That's affirmative.

MITCHELL And the grade is getting pretty steep.

CAPCOM Have you got any estimate.

MITCHELL And the soil here is getting firmer I think than we've been on before. Except around what the mounds in between craters where it's been thrown out. But, by and large, it seems to have a little firmer footing. We're not sinking in as deep.

CAPCOM That should help you with the climb there.

MITCHELL Yes. It helps a little bit. Al picked up the - Al's got the back of the MET now and we're carrying it up. I think it seems easier.

SHEPARD Yes.

CAPCOM There's two guys here that figured you'd carry it up.

MITCHELL Say again.

CAPCOM There's twp guys sitting next to me here that kind of figured you'd end up carrying it up.

MITCHELL It will roll along here except we just move faster carrying it.

SHEPARD Okay. You want to (garbled) with this rock.

MITCHELL Okay.

SHEPARD This is the first big boulder we've seen, Houston. I think it's worthwhile taking a picture of it with the closeup. (garbled)

MITCHELL I'll pull it up. We probably ought to take a pan to locate everything here while you're taking a closeup.

CAPCOM Okay. I understand, Al. You're shooting a closeup shot of a big boulder.

CAPCOM What's the size of this one, Al?

SHEPARD Okay. The shots been taken on the closeup counter number 317. Sun angle was 8 o'clock. The - this particular one is only about 12 feet long by about 4 feet wide. It's about 1/3 buried. It's a, oh, very weathered. There are some evidences of some crystal shining through, some of the ractures.

MITCHELL I'm taking a half light of the rock in the pan now from this location. I'll document our (garbled) going to the top of Cone Crater.

CAPCOM Roger. Copy.

PAO The reference to carrying the MET up to the ridge of Cone Crater, the backup crew is here at the capcom console and apparently they had a bet on preflight. We're at 133 hours 39 minutes ground elapsed time, 1 hours 50 minutes since cabin depress.

MITCHELL Then I can look right across into the breach in the north rim of Neighbor. (garbled). We're about even with it now.

END OF TAPE

MITCHELL For each of the north, rille of old nameless. We're about even with it now.

CAPCOM Okay, and copied, Ed. and was there any noticeable dust on the large bolder?

MITCHELL Not where I took the picture, but there's some fillets are at the bottom.

CAPCOM Okay, copied now.

MITCHELL Okay, 44, Fred, was my frame count.

CAPCOM Roger, Ed.

MITCHELL I believe that's it, if I can remember it.

SHEPARD Right here, Ed.

MITCHELL Now, I'm going to move on out, I'll head up here.

PAO Shepard, Mitchell pressing on toward the rim of Cone Crator.

SHEPARD Okay, we're starting out the right flank of the crator, now, Houston, the bump probably about 18 percent, the surface texture is still pretty much the same as far as the raindrop pattern is concerned. But, we seem to find an increasing population of smaller rocks.

CAPCOM Roger, Al.

MITCHELL The small rocks and smaller - smaller fresher crators as well. Well, wait a minute, maybe I'm being deceived. With this slope the front angle is entirely different than it is on the flat land, the crators look sharper and they shadow.

SHEPARD Okay, let's make an EVA stop.

MITCHELL Okay, let me fall off.

SHEPARD I can stop and rest here for a minute.

MITCHELL Okay.

SHEPARD Well, I tell you, we're really going to get a panarama, we've got a tremendous lot here, Houston, already. And we're not quite to the rim. Head towards that little namelesses over there, right along our track, or just south of our track I should say. We made the right approach, we came up through the valley and over the range and down into the bowl. Couldn't have planned it better.

MITCHELL I thought we were in a low spot with the LM, but it turns out we're really not in the lowest spot around, I don't think.

SHEPARD No, I tell you it's probably the lowest spot right ...

MITCHELL Oh, right in that particular little area.

SHEPARD In that area, yeah.

MITCHELL But, that's the lowest part over to the right that I was talking about. And there's a low spot ...

SHEPARD Well, there's a crator over there, as well.

MITCHELL Yeah, yeah. Fredo, you can sure be deceived by slopes, here, the sun angle is very deceiving. Okay, let me pull awhile. You ready to go?

SHEPARD Yeah, lift it.

MITCHELL May go back to (garble), if they don't call first.

SHEPARD I guess right straight up is the best way to go.

MITCHELL Beg you pardon?

SHEPARD Right straight up is the best way to go. Better go easy on the rocks.

MITCHELL Okay, get a little momentum going.

END OF TAPE

MITCHELL Okay. I'll get a little momentum going.

SHEPARD Houston, we're proceeding onward now.

CAPCOM Roger, Al.

MITCHELL And, the boulder fields that Al pointed out. The rocks and boulders are getting more numerous toward the top here. However it's nothing like the rubble of the large boulders that we saw at the Nevada test site. Now, is this surprising to me. I expected it to be more like that, but it is not, at least not where we're looking now.

SHEPARD You know we haven't reached the rim, yet.

MITCHELL Oh boy, we got fooled on that one.

MITCHELL I'm not sure that was flank we were in a minute ago either. Wait a minute. Just (garbled) the rim's right here. That's the ... that's the east - shoulder running down from the Cone. That's flank over there. We're going to hit it on the south side. We'll have to move on around it. This looks like easy going right here. See there's the boulder field that shows in the photograph right up ahead of us.

SHEPARD There's a crater up there, Ed.

MITCHELL Yeah.

SHEPARD Pardon, crater up there.

CAPCOM Yea, Al and Ed, they'd like you to take another stop here.

SHEPARD Okay.

SHEPARD Really got a pretty steep slope here

CAPCOM Yeah, we kind of figured that from listening to you.

SHEPARD Okay. Well, now that's apparently the rim of Cone over there, and we're about well over 2 hours now. Is that right, Fred?

CAPCOM Okay. We're still on 157 and a half now.

SHEPARD Okay.

SHEPARD That's at least 30 minutes up here.

CAPCOM Yep.

SHEPARD And, I would say we'd probably do better to go up to those boulders there. (garbled) EVA is the turn around point.

MITCHELL Yep. It could take longer than we expected.

SHEPARD Our positions are all in doubt now, Fredo. What we were looking at was a flank, but it wasn't really ... the top of it wasn't the rim of Cone. We've got a ways to go yet.

CAPCOM Okay, Ed. And -

SHEPARD - Perhaps you could think - Perhaps you can think what it is you want, I'd say that the rim is at least 30 minutes away. We're approaching the edge of the'

SHEPARD boulder field here from the south flank.

MITCHELL Let's look at the map.

SHEPARD and what I'm proposing is perhaps we use that as the turn around point. It seems to me that we spend a lot more time in traverse if we don't, and we don't get very many samples.

CAPCOM Roger, Al. And, just a couple of questions they have up now. Like your (garbled). Did you see any dust particularly on the top surfaces of boulders in the area. And, any comparisons between the boulders you see slipping around. Are they all the same or do some types appear different.

MITCHELL It's too early to make that sort of judgement, but we'll tell you when we get there. We're not really in that boulder territory yet.

SHEPARD I think, Fredo. If you'll keep those questions in mind. The best thing for us to do is to get up here and document a sample. I feel pretty sure is the Cone ejecta and then when we head down the stern we'll be able to see these subvariations and rock types a lot better than we are right now.

CAPCOM Roger, Al.

PAO Shepards heart rate rose to 150, Mitchells

END OF TAPE

CAPCOM Roger, Al.

PAO Shepard's heart rate rose to 150, Mitchell's 128. This occasioned the second rest stop.

MITCHELL Hey, Al.

SHEPARD Yes.

MITCHELL I'd - no, let's keep going around this crater. (garbled) right here.

SHEPARD Well, maybe. I thought we'd get those boulders up there, Ed.

MITCHELL Yes.

SHEPARD (garbled)

MITCHELL Yes. Let's head right for that boulder at the top. I think we'll be moving one of the - -

SHEPARD Right here.

MITCHELL Pardon.

SHEPARD Right here.

MITCHELL Up at the top, you mean.

SHEPARD No.

MITCHELL Huh?

SHEPARD I don't think we'll have time to go up there.

MITCHELL Oh, let's give it a whirl. Gee whiz. We can't stop without looking into Cone Crater. (garbled) everything if we don't get there.

SHEPARD I think we'll waste an awful lot of time travelling and not much documenting.

MITCHELL Well, the information we're going to find, I think, is going to be right on top.

CAPCOM We establish - -

SHEPARD Okay, Ed. Look at this you're going through. (garbled) very light grey vine underneath the - -

MITCHELL Yes. It looks like along our path there's quite a bit of it. See how this crater - - Fredo, how far behind timeline are we?

CAPCOM Okay. The best I can tell right now, about 25 minutes down now.

SHEPARD Okay.

MITCHELL We'll be an hour down by the time we get to that crater. We need six samples.

MITCHELL I think we're going to find what we're looking for up there.

CAPCOM Okay, Al and Ed. In view of your essay of where your location is and how long it's going to take to get to Cone, the word from the back room is they'd like you to consider where you are, the edge of Cone Crater.

SHEPARD Picture 6.

CAPCOM Okay. That decision I guess was based on Al's estimate of another, at least, 30 minutes and

CAPCOM of course, we cannot see that from here. It's kind of your judgement on that.

MITCHELL Well, we're 3/4 there.

PAO Mitchell reporting they're 3/4 the way to Cone Crater. We'll stand by.

MITCHELL Why don't we lose our bet, Al, and leave the MET and get on up there?

MITCHELL We could make it a lot faster (garbled)

SHEPARD No. I think what we're looking at right here, this boulder field, Ed, is the stuff that's ejected from Cone.

MITCHELL But not the lowermost part, which is what we're interested in.

SHEPARD Okay. We'll press on a little farther Houston. And keep your eye on the time.

CAPCOM Okay. And as of right now we have a 30 minute extension.

PAO That callup from head Fred Haise, a 30 minute extension to the EVA time. We'll stand by.

CAPCOM And Al, did you copy our 30 minute extension?

SHEPARD We got it.

MITCHELL Yes. That's affirmative, Fred. Thank you.

END OF TAPE

SHEPARD Okay. Then up at this little rise here take a panorama.

MITCHELL Good.

SHEPARD Okay, I'll go to medium close.

MITCHELL Okay, I'll take a pan from here.

CAPCOM Roger, Ed.

SHEPARD I want to tell you, it's a fantastic view from here. As this pan will show.

SHEPARD We're approaching the edge of the rugged boulder field to the west rim. It appears as though the best for us to do will be go to the west rim and document it from there even though the sun angle may not be quite as good. Well, we're pushing out in that direction.

CAPCOM Roger, Al. You're moving to the west then.

MITCHELL Al is back to min flow. Here we're moving again.

CAPCOM And Al and Ed, Deke says he'll cover a bet if you'll drop the MET.

MITCHELL It's that hard with the MET. We need those tools.

SHEPARD No, the MET's not slowing us down, Houston. It's just a question of time, we'll get there.

CAPCOM Roger, Al.

MITCHELL Give you a hand, Al.

SHEPARD It's all right.

MITCHELL You cut a hole there with your wheel when you went around that corner. Al?

SHEPARD Yeh.

MITCHELL Head left. It's right up there.

SHEPARD Yeh. I'm going there.

PAO Ground elapsed time 133 hours 58 minutes. Two hours nine minutes since cabin depressurization.

MITCHELL You need a little more lift. Go up to the - I'll give you a hand.

END OF TAPE

SHEPARD Okay. We're now right in front of the boulder field on the west rim. We haven't quite reached the rim yet.
SHEPARD Okay. Want to rest here a minute.
MITCHELL Yes.
MITCHELL Let's take a look at the map. I think we're closer than that.
SHEPARD We ought to just go ahead slowly with this.
SHEPARD Okay. Another crater.
MITCHELL Yes. The rim's right up here. Let's see if we can spot this one, Al.
SHEPARD Okay.
MITCHELL On the map.
CAPCOM Okay. And Al, it looks like you'd be a little bit more comfortable there is you're on the intermediate.
SHEPARD Yes. Okay. We're resting.
MITCHELL Look. I want to show you something. Here's that crater, we're down here. Go got to go there.
SHEPARD What crater?
MITCHELL That crater right there is that one right there.
SHEPARD Okay.
SHEPARD Want to pull for a while?
MITCHELL Yes.
SHEPARD Okay. We're about the maximum elevation now, Houston. It's a little (garbled) a little bit. And it looks like we'll be approaching the rim here very shortly.
CAPCOM Roger, Al. And you can leave the dial in intermediate. We're fat on the - for the feedwater.
SHEPARD Okay. Thank you.
MITCHELL Let me set mine. We're - I was going to say let me set mine, Houston, if I'm okay too.
CAPCOM That's affirm. I guess the low item is the battery.
MITCHELL Okay. It's going over. I'll get it. At that stabilization, Al, it's going to turn over.
SHEPARD Okay. We better reconnoiter here. I don't see the crater yet.
MITCHELL I agree. (garbled) in my wheels.
PAO Shepard, Mitchell trying to hold the MET steady. The pullcart steady as they're going through this boulder field enroute to the rim of Cone Crater.
SHEPARD Is this boulder pattern at all that we're in here right now the boulder field at all.
MITCHELL I though it was on the south rim.

CAPCOM And Al and Ed, do you have the rim in sight at this time?

MITCHELL Oh, yes.

SHEPARD It's affirmative. It's down in the valley.

CAPCOM Sorry. You misunderstood the question. I meant the rim of Cone Crater.

SHEPARD Oh, the rim. That is negative. We don't - haven't found that yet.

END OF TAPE

MITCHELL This big boulder, right here, Al, which stands out bigger than anything else ought to be - ought to be able to see it.

SHEPARD Well, I don't know what the rim is still way up there by the looks of things.

CAPCOM And, Ed, now, we've already eaten in our 30 minute extension and we're passed that now, I think we'd better proceed with the sampling and continue with the EVA.

MITCHELL Okay, Fredo.

SHEPARD Okay, we'll observe with a pan from here. I'll take that.

MITCHELL Alright, I will third family.

PAO Shepard, Mitchell stopping short at this point to acquire some rock samples.

MITCHELL All the field covered. Perhaps as much as (garble) samples that (garble). that we might have in Cone Crator.

CAPCOM Roger, Al.

SHEPARD (garble) Okay, you want us to start taking documented samples.

CAPCOM Roger.

SHEPARD Alright. I would say, Houston, that most of these bolders are the same brownish grey that we've found. But, we see one that is definately almost white in color, a very definate difference in color which would - it was definately almost white in color, a very definate difference in color, which we'll document. We noted that beneath this dark brown regolith, there is a very light brown layer and I'll think we'll get a core cube right here to show that. As a matter of fact, I think I'll do that right now.

CAPCOM Roger, Al, and for your information we won't be doing the polimetric experiment.

SHEPARD I affirm, you will not be.

CAPCOM That's affirm, you can delete that one.

SHEPARD Hey, I'll bring back the min.

CAPCOM Roger, Al. And Ed, I need an opinion. Do you think you'd be able to deploy and take the second and last LPM reading at this location?

MITCHELL Yeah, we can take it at this location.

CAPCOM Okay, what I have on the board here, to perform and I guess we'll call it C prime is sample and I guess you already got a pan, I thought somebody did, and the LPM then.

SJE¼ARD Okay.

MITCHELL Okay, let me suggest that we take one of these football sized rocks from here, too, Fredo.

CAPCOM Yeah, roger, Al, very good.

MITCHELL This area that we're in right now, is for sampling, Ed, is a pretty darn rugged bolder spread area. One of the smaller rocks I've sampled is going into 7 n ...

END OF TAPE

CAPCOM And, Al and Ed, when you can work it in we'd like an EMU check.

SHEPARD Okay, Al. 3.75 and reading 52 on the oxygen and I'm in medium flow and I'm comfortable, no flags.

MITCHELL Okay. I'm reading 375, I'm 48 on oxygen, I'm now a min. flow having just shifted, and I'm comfortable.

CAPCOM Roger.

MITCHELL Okay. LPM deployed.

PAO Shepard, Mitchell stopping of the realm of Cone crater in a boulder field. At this position they will take a magnetometer reading, gather samples, including perhaps a football size rock and photography.

SHEPARD Okay. The core tube sample turned out to only be about 3 quarters of a tube. The area is apparently very rocky but I did get down into the second layer of the underlying layer of the regolith which was white as opposed to being dark brown.

PAO Shepard reports taking core sample.

CAPCOM Roger, Al. Understand you get down to another layer that looks white below the dark brown.

SHEPARD On second thought, forget that core tube, it's too granular and most of the material came out of the tube. I'll just clip a couple samples and bag it of the 2 top layers.

CAPCOM Roger, Al.

MITCHELL Okay, Fredo, I'm having a hard time leveling the - there it is.

CAPCOM And, Al, about what sample bag number are you up to now?

MITCHELL 7N was the last one I put in.

SHEPARD Okay, Fredo, we're up on 12 here. I don't know whether that's consecutive or not.

MITCHELL Could be.

MITCHELL Fredo, I'm back at the MET having left the LPM, took my time.

CAPCOM Roger, Ed.

MITCHELL The LPM is aligeed about 3 degrees to the north of the east-west line.

CAPCOM Okay. 3 degrees to north.

MITCHELL And it is level, the bubble just about in the center.

CAPCOM About what's the size of the largest block you all have passed, Ed?

MITCHELL That we've gone passed?

CAPCOM That's right.

MITCHELL Oh, 25 feet long.

SHEPARD Hand me the shovel, please, Ed.

MITCHELL Roger.

SHEPARD Thank you.

END OF TAPE

MITCHELL Getting ready, Fred, to read the LBM.
MITCHELL Fred-O, Houston, you still with us?
CAPCOM Any time, Ed. You go ahead -
MITCHELL I'm going to read the LBM.
CAPCOM Go ahead, Ed.
MITCHELL Okay. I'm on the (garble) 4.9 on X, Y 4.6, Z 6.5, X 4.9, Y 4.6, Z 7.0, X 4.9, Y 4.5, Z 7.5, and it's still going up in Z. Better give you one more set. X is 4.6, Y is 4.4, Z is 8.0 and it seems stable at that level.
CAPCOM Roger, Ed. Copy, got all four sets and all were taken on low settings, and you can discard the instrument at this point.
MITCHELL Okay. It is done.
CAPCOM And, Al, did you say you had taken a sample of the white boulder or was that too hard to sample?
SHEPARD No. Now I'm sampling a layer that is sort of a light gray just under a regolith with a bag number 9 and bag number 10 with a sample of some of the surface rocks that were - that were right around that area. It looks like kind of a secondary impact that has disrupted the surface regolith and cut out down into the gray area.
CAPCOM Roger, Al.
PAO Heart rates of the two crew members down appreciably now, Shepard 108, Mitchell 86. Shepard working harder at this time taking samples while Mitchell leveling the magnetometer.
CAPCOM Okay, and Ed is the LPM still in your immediate area?
MITCHELL Yep.
CAPCOM Okay they wanted a temperature reading off of it.
MITCHELL Okay, we'll have it for you in a minute.
CAPCOM Okay, and Al -
MITCHELL Do you want the new one?
CAPCOM did you mention either seeing a white boulder or a brown a brownish gray boulder earlier?
SHEPARD I mentioned there's a boulder definitely whitish in color, Fred, we'll be over there in a minute. It's not in our immediate vicinity. But I definitely feel it's worthwhile sampling.
CAPCOM That's affirm,
SHEPARD Okay.
CAPCOM They concur would like a sample from the white boulder, Go ahead Ed..
MITCHELL About 125 on the LPM.
CAPCOM Roger, copy.
MITCHELL Okay, where did you hit for -
SHEPARD Well.

SHEPARD The first thing that we ought to do is if we want to drag the MET with us is, see that white boulder down there.

MITCHELL Yea, I saw it (GARBLE)

SHEPARD We can sample it with both types of boulder right there in our area so lets go on down there.

MITCHELL Right.

SHEPARD And can you give us feel Houston, when you want us to leave the area.

CAPCOM Okay, estimated time at departure is in about 8 minutes, 7 and 1 half minutes.

SHEPARD Okay.

MITCHELL Okay, board the hammer, oh damn it.

END OF TAPE

SHEPARD Okay.

SHEPARD Okay. Brought the hammer.

MITCHELL I've got it.

SHEPARD Okay. I guess we just run down there this way, huh?

MITCHELL Yes.

MITCHELL Okay. That's it. One of these boulders, Fredo is broken open. They're really brown boulders on the outside and the interface that's broken is white and then another one that most of it is white. They're right in the same area.

CAPCOM Okay, Ed. I assume you're going to sample some of those.

MITCHELL That's where we're headed right now. It's about 50 yards away.

SHEPARD Why don't you go on down and start and let me brign the MET down.

MITCHELL All right. Yes. It's further than it looks.

SHEPARD That's the order of the day.

MITCHELL Okay, Fredo. I'm right in the midst of a whole pile of very large boulders here. It's anything I can do to grab a meaningful sample.

CAPCOM Roger, Ed.

MITCHELL First of all, let me start my photographing. This whole area. They're awful darn big but there's hardly anything I can find to see if I can chip one.

CAPCOM Okay, Ed, now.

MITCHELL Okay, Fredo (garbled)

CAPCOM To get us - to get us back on the old timeline here when you depart C here we'd like to proceed directly to F, Weird, and we'll pick back up from that point. Enroute you can make grab samples as you see fit.

MITCHELL Okay.

CAPCOM And another note I'll remind you of later on.

CAPCOM Go ahead. I'm sorry.

MITCHELL I chipped off one of the white rocks. I put it in bag 13N. I'll photograph it. There don't seem to be any samples of the white rock lying around that are small enough for me to sample. I want to be sure they're what I'm looking for.

CAPCOM Roger, Ed. 13N.

SHEPARD And Al is just going around picking up hand size grab samples from the immediate vicinity of where Ed is operating. I have a couple that are going in bag 16.

CAPCOM Roger, Al.

APOLLO 14 MISSION COMMENTARY, 2/6/71, 4:47 CST, 134:26 GET, 431/2

PAO Apollo Control - -

END OF TAPE

PAO Apollo Control, Houston 134 hours 24 minutes, 2 hours 36 minutes since cabin depress. Two of the stops have been deleted in the traverse. The tasks that were scheduled E will be moved back to station G. The next stop will be at station F from -

SHEPARD (garbled)

MITCHELL That's alright, go ahead.

SHEPARD There's a football, Houston, coming out of this area which will not be bagged. It is appeared to be the prevalent rock of the area.

MITCHELL That's better.

CAPCOM Roger, Al, we copy.

SHEPARD Let's go on over to (garbled)

SHEPARD Okay. Do you have a sample of that white rock?

MITCHELL Got one particle.

SHEPARD Put it right here.

MITCHELL I don't think it'll go.

SHEPARD Yea.

MITCHELL Core tubes out aline.

MITCHELL Okay. We'll just try back that way.

CAPCOM Okay, Al and Ed. There is about 1 more minute here.

SHEPARD Okay. We're moving on down the hill now. Okay. Can you see Weird from here.

MITCHELL (garbled).

SHEPARD Kind of hard to find.

MITCHELL I can't even see triplet from here.

SHEPARD Triplet (laughter)

MITCHELL Stand by Al, let me take one quick look at the map before we move. Waste the minute looking.

SHEPARD If I was you, I'd take the map (garbled) take you down to the general area of the LM and you'll probably get enough elevation view from down there so we can see Weird.

MITCHELL Okay. We're leaving the scene now. (garbled)

CAPCOM Roger, Al. And to rephase the question, earlier on the way back down, you might integrate any distinction in the lithology on the way back with a better sun angle and you're free to take grab samples on route to Weird.

SHEPARD Okay. I think that's weird. To the north, I mean just to the left of north triplet, and north triplet appear to be right behind the LM.

MITCHELL Yeah.

SHEPARD You agree.

MITCHELL It's between ... it's half way between the two large boulders and one way down.

SHEPARD Yeah, I think that's right. That's right.

SHEPARD Un huh, that's the one.

MITCHELL Okay. These are rocks, these boulders in this field here - appear to be very weathered, obviously not by atmosphere but eroded by some process. Because they all show cracks. They show evidences of being broken up either by impact or subsequently and it looks to me as though these rocks are really pretty old.

CAPCOM Roger, Al and do you have anything left on the 16 millimeter or has it been running on the MET.

SHEPARD I'm right ahead of you. I've already turned it on, now I follow the progress.

CAPCOM Roger, Al.

SHEPARD Are you reading now?

MITCHELL Yeah.

MITCHELL Have you checked the setting on it?

SHEPARD It's in there.

CAPCOM And Al without taking any extra time if you come across any boulders large enough we might fill the (garbled) on the way down. If you haven't already done that on the way up.

SHEPARD I don't think we're going to find any long neck pass big enough Fredo. The very largest ones are off to the right - south of us a bit, set up the hill a bit more.

MITCHELL Let's go on are you on the thing back there.

SHEPARD No.

MITCHELL Okay.

SHEPARD Want me to hold you back.

MITCHELL No that's all right.

SHEPARD Could you come over here a -

END OF TAPE

MITCHELL Want me to hold you back?
SHEPARD No, Ed.
MITCHELL Break off, but you're gonna go over here in a minute.
PAO Shepard's 02 suit temperature had peaked in the 80's, but now reading in the high 60's. Mitchell's present readings in the high 70's.
SHEPARD I hear again Houston, the temperature here appears to be - Our region appears to be a lot of large - of a - dribbles, approximately a quarter of an inch on down. Just along the slide and the same texture ground we spoke of before and photographed, also here.
CAPCOM Roger, Al.
SHEPARD Okay, the way we've got this (garbled) weird.
MITCHELL Yep, the LM looks like it's getting much closer.
SHEPARD Is it Weird right down there do you think?
MITCHELL Yep. Oh - here it is. It'll be Weird at almost due east of the LM.
CAPCOM And Al and Ed we'd like to have you -
SHEPARD (garbled)
SHEPARD Okay, this is Al, 3.75 and 45 percent and I'm on medium throw and I'm comfortable.
MITCHELL Okay, this is Ed, I'm on 3.75 menthro I'm 40 percent, and very comfortable. And there is Weird (garbled). You can see the triple crater in it the white spot.
SHEPARD Okay, got it.
MITCHELL Got it?
SHEPARD Yep. With the boulder is in the near foreground.
MITCHELL Yep.
SHEPARD We're continuing now out of the boulder field Houston, and getting on down the flank.
CAPCOM Roger, Al.
SHEPARD And I believe I'll just get a shot - I'll get a sample of that baby Hugh, let's grab some for now.
MITCHELL Okay.
SHEPARD We're going to get a quick grab here of a rock and I'll put it on it because it's got some tremendous fillers in it. (garble) before you get a quick shot there. Okay, put the PCS there. First. That looks like, we ought to get a piece of that baby.
MITCHELL No man, that's hard, hard, hard. I guess that's Basalt isn't it?
SHEPARD Yeah.
SHEPARD Okay, here's a piece of it. Bag?
MITCHELL I'm right behind you.

SHEPARD (garbled) don't lose it.
SHEPARD Okay, here we're about - it's about no, I guess not.
MITCHELL Hold it a minute, hold it, I'm gonna get a bag. This darn bag has been (garbled) isn't doing what it's supposed to do.
SHEPARD No. Better take two - no
MITCHELL Houston, what we're taking in at 14 in.
CAPCOM Roger, Ed. 14 in.
MITCHELL Assorted rock. Large filament rock that Al photographed. Okay, let's go, you want me to hold one?
SHEPARD No, just work it a little way and let it drop off.
MITCHELL And you want me to hold back awhile?
SHEPARD No, we'll just let it run. Hope we don't lose anything.

END OF TAPE

SHEPARD Hope we didn't lose anything.

MITCHELL No. It's holding in very well.

MITCHELL Didn't turn over. A little higher CG now than we had before. With that big rock in there.

PAO Meanwhile, in Kitty Hawk, Stu Roosa has just finished Descartes photography.

SHEPARD Fredo, can you give us an idea at what time we should arrive at Weird?

CAPCOM Stand by one.

PAO For this rev, Roosa didn't use the Hycon luner topographic camera. The Hasselblad with the 500 millimeter lens was used instead. Meanwhile, it is undecided which camera will be used for the rev coming up, for this photography.

MITCHELL That 16 millimeter stuck, however, in flight.

SHEPARD Very good - it's taken photos from every view.

MITCHELL Okay. It looks like that cut very deep though.

SHEPARD Yes.

MITCHELL Let's - hey, here's a whole batch of them right down here, Al. Let's grab those.

SHEPARD Which way, left or right?

MITCHELL Off to the left and ahead - around that little crater. They're all in this same area.

SHEPARD Houston, unable to see any stratigraphy in any of these craters. The sloping has been such that pretty much destroyed.

MITCHELL What about this one right here.

CAPCOM Roger, Al. And position wise you're past Flank now. Is that correct? Or at least a mean position of Flank?

SHEPARD No we're not, Fredo, we haven't passed by Flank yet. I'll say we're about a 15 minutes away from Weird. A (garble).

MITCHELL As a matter of fact, I think this is Flank right here.

SHEPARD (garble)

MITCHELL I'll get the rock onboard.

SHEPARD Okay, Let's press.

CAPCOM Roger, and one other question up there is to check for the stratigraphy you reported earlier of the light grey white layer below the top. Did you see that exposed anywhere?

SHEPARD Okay, we did not see that until he started approaching the edge of the boulder field. There's no evidence of that at all that we noticed. Not down this far.

MITCHELL One thing I did notice further outside of where we saw the white underneath

MITCHELL but it looks like an impact that's either bit of the white rock or it was a splatter of white, and it was just outside where Al was reporting that the underlying layer was white. As a matter of fact - no that just - the sun angle was causing it. Right now some of the spray that we're kicking up looks white underneath, but I'm convinced it's just the angle. I looked back and it was white underneath, but I'm convinced it's just the angle. I looked back the other way and it's not the same shade.

CAPCOM Roger, Ed.

PAO Shepard, Mitchell heading downhill now toward Weird Crater stationed out for taking samples along the way. We're at 134 hours 38 minutes ground elapsed time.

MITCHELL Hold it.

SHEPARD That's what I'm trying to do.

PAO 134 hours 39 minutes ground elapsed time and we're at 2 hours 50 minutes since cabin depressurization. This is Apollo Control, Houston continuing to monitor.

SHEPARD Okay, we're moving along pretty well, Fred, at this point. And I'd say we're still probably about 10 minutes away from Weird.

CAPCOM Very good, Al. Looks kinda like you're making a little better time going down than up.

END OF TAPE

SHEPARD away from Weird.

CAPCOM Very good, Al. It looks kinda like you're making a little better time going down than up.

SHEPARD Data flow. Different wave Fredo. who changed the help. Do you want me to move that baby, puts is right there with the shape. The same arch-band on the top.

MITCHELL Yep.

SHEPARD Going down GARBLE. I think we all want to see it.

SHEPARD GARBLE lying right here, isn't it.

SHEPARD I wouldn't do a thing until I get down and look at the correct pattern.

MITCHELL It probably is Al. But if this is really bart flags, we should have been at the top of Cone Crater where we were.

SHEPARD Yeah, I know.

MITCHELL I think we're already passed by it.

CAPCOM Okay, it maybe looks down here Ed that maybe what you're looking at there. If you notice point size crater is the one by E.

MITCHELL Well, this is a big crater. It's 40 or 50 meters across. It has a fairly sharp crater in the south edge of it.

SHEPARD GARBLE.

CAPCOM Okay, that looks like it may be the one by E.

SHEPARD Yep, I think that's it Fredo. And it's northerly, 50 or 60 feet deep.

MITCHELL Why don't we just grab a couple from right here.

SHEPARD Yeah.

MITCHELL Okay.

SHEPARD That baby came apart.

MITCHELL Very soft.

SHEPARD That's falling apart as you pick it up, very crumbly isn't it?

MITCHELL Okay, you got a bag ready?

SHEPARD Yeah.

SHEPARD Very, very soft rock there by that crater plus another one very close to us with crystal in it. Specimen now going into the bag.

SHEPARD 15 N.

MITCHELL Okay.

CAPCOM Okay, copy 15 n.

SHEPARD Are you in a rush.

MITCHELL Not quite, let me get it in there. Dave we don't want to leave anything there.

CAPCOM Okay.

MITCHELL Okay. That's where we're going. Right there.

SHEPARD Yeah, go ahead for Weird.

MITCHELL Head right for the big boulder. Then Weird's right beyond it.

MITCHELL Easy.

SHEPARD Okay, keep going.

MITCHELL Madrid, I'm going back through immediate cooling.

CAPCOM Roger, Ed.

MITCHELL Well, the problem of going down hill here is that you had to prick essentially the fraction I guess around your body it created a halo effect in your shadow and you just can't see a darn thing right in front of you.

CAPCOM That's okay Ed.

MITCHELL Kinda washed out - kinda washed out. immediately down in front of you. We're very pre-dominantly down in front now.

END OF TAPE

SHEPARD Okay, Fred, we're still moving, and looks about 3 minutes away now from Weird.

CAPCOM Roger out.

PAO Shepard reporting they're about 3 minutes away from Weird.

SHEPARD The crater we are going by now, we're just to the north of it Fredo, is an old subdued crater.

MITCHELL (GARBLE)

SHEPARD You want to run over behind that boulder over there, and I'll try and talk to you.

MITCHELL You're the one that has to get behind it and try to talk ton.

SHEPARD That's right.

MITCHELL I'll put the MET, go ahead.

MITCHELL Okay.

SHEPARD On second thought, maybe it's not big enough, I'll help.

MITCHELL Don't think it is.

SHEPARD No, I guess not.

MITCHELL Sure is a big old boulder, I'll take a picture of it anyway.

CAPCOM Okay, and this, this big boulder Al is just about at Weird. Is that right?

SHEPARD Oh, probably a couple hundred feet short of Weird.

SHEPARD This country is so rolling and undulating, Fred, with rises and dips everywhere, that you can be going by a fairly good size crater and not even recognize it.

CAPCOM Roger.

MITCHELL Okay, I'm back with you. Okay, I think this is Weird right here, right here forward Al. See that fresh one there. I think that's the fresh one of the Weird pattern.

CAPCOM Okay, Al, and Ed, on the Weird task, we'd like to pan and grab samples on Weird, and we'll pick up most of our task that we bypassed at E, when we get to Triplet.

SHEPARD Okay. Okay, I'll get the pan. I think (GARBLE) is right in here.

MITCHELL Where are you?

SHEPARD Behind you to your left. Any rates in there?

MITCHELL Well, I didn't think so, I think this is it right here.

SHEPARD It looks too small I believe.

MITCHELL Well, anyway we're in the area, Houston.

SHEPARD We've got a minute to find it.

CAPCOM Okay, Al, I think the (GARBLE) will fill us in as to the exact position.

SHEPARD Okay, craters under way now.

MITCHELL Okay, task is complete.

CAPCOM Okay, Roger Al.

SHEPARD Did you get a rab sample Ed?

MITCHELL Roger, got some right up in here, Al.

PAO Shepard, Mitchell now at Weird crater completing their two tasks there, and to pick up lunar samples and take a photo panarama. We're at 134 hours 48 minutes GET. 3 hours since time of cabin depressurasation.

CAPCOM I guess this is going in bag 16, is that right Ed?

MITCHELL This is in bag 17 Fred. 16 got used some time back.

CAPCOM Okay.

SHEPARD Okay, lets press on.

MITCHELL Okay, this darn rig is hard to fold out.

SHEPARD We've got a pan and a grab sample, what else do we want from here Houston?

CAPCOM To me thats it Al. We would like to proceed on to the north Triplet and

END OF TAPE

CAPCOM Okay, - that's it, Al. We'd like to proceed on to the north Triplet, and I'll give you the tasks when we get there.

SHEPARD Okay, we'll join you at the north Triplet.

MITCHELL You ran out from under me just as I was picking it up.

SHEPARD Ha, ha, sorry.

MITCHELL Okay. Okay. There now.

CAPCOM Okay, Al and Ed, -

MITCHELL (garble)

CAPCOM - for your stop for the G, we'd like that to take an estimated one crater diameter short of the Crater Cone, here.

MITCHELL One - stop one crater diameter short.

CAPCOM That's affirm because some of the items coming up are the core and the trench. Triple core.

MITCHELL Okay. Oh, I think we're seeing the rim of the Triplet series right ahead of us, aren't we, Al?

SHEPARD I would say so, yeah. We can say that's the rim of the north right there.

MITCHELL Yeah. It's got bolders on it, and that's the only thing big enough to have bolders. We're probably about 1 diameter out right now.

SHEPARD I'd say we are. Right here.

MITCHELL The way we've been estimating distances today, that rim has to be at least 6 miles from here.

SHEPARD Okay, Houston, we're about 1 diameter to the east of (garbled) Triplet.

MITCHELL To the west of the (garbled) Triplets here.

CAPCOM Okay, copied, and

MITCHELL Okay.

CAPCOM Your number 1 item is the triple core.

SHEPARD Okay.

MITCHELL First and third core tube.

SHEPARD Ed, why don't you use clean ones.

MITCHELL I don't have clean ones.

SHEPARD Yeah, you do. They're down under this pocket right there.

MITCHELL This one?

SHEPARD Let me get my camera tightened up.

MITCHELL This one's been used.

SHEPARD Nope, nope, nope. In here Ed.

MITCHELL Oh, okay.

SHEPARD The three tabs should be clean.

MITCHELL All right.

SHEPARD Okay, we'll pull it back together here.

SHEPARD (garble)

PAO Shepard and Mitchell moving faster on this traverse back.

MITCHELL Clear to the bottom (garble)

SHEPARD Okay, we've got the camera back together. Okay, Fredo, for your info the CDR commander is reading 117.

CAPCOM Roger, Al, 117.

SHEPARD Okay, I'll get it.

MITCHELL Start with this one. We've only got two fresh ones in here. You've got four out that are used. Or, it looks like they're used.

SHEPARD The three tabbed ones we haven't used yet. Let me get them, Ed.

MITCHELL Okay, I'll take the tabbing off of this one.

SHEPARD Yeah, I think that's - that's the best way to do it. Let's make them 1, 2, 3 for simplicity sake.

MITCHELL I don't have a back from that one hard to tell.

SHEPARD The bottom one will be number 1 tube with a tab, Fredo.

CAPCOM Roger.

MITCHELL Here's number 3.

SHEPARD 3. Hold on to that one, Ed. And the other one will be number 2 with a tab.

END OF TAPE

SHEPARD And they then will be number two with a pad. And (garbled) will be number three with a pad.

CAPCOM Roger, Al. And we're going to subtract off 15 minutes from that 30 minute extension due to PLSS oxygen.

SHEPARD Okay.

CAPCOM Good for about -

SHEPARD We'll be in -

SHEPARD (garbled)

CAPCOM This is Houston, this is approximately a 25 minutes stop, do you hear?

SHEPARD 25 minutes till what?

MITCHELL Stopping.

MITCHELL Okay, I got this one, go ahead, start your trench if you like.

PAO Starting the triple core sample now. The core tubes approximately 15 inches each, Mitchell will do the hammering into the lunar soil.

SHEPARD I'll dig the trench into the far wall of this crater here, Ed.

PAO While Mitchell taking the core tube sample, Al Shepard will be digging the trench.

MITCHELL Fredo, I've tried to push in the core tubes, triple core tube, I get maybe a three to four inches of pushing in by hand, and it's just surface stuff. A very soft, it will not support the weight of the core tubes. Now I've got it balanced, now I can take a picture of it perhaps.

CAPCOM Okay, we're reading you Ed.

MITCHELL Okay, we'll try to drive it.

CAPCOM And, do I understand correctly, Ed that you're taking care to triple core aren't you on that?

MITCHELL That's affirm. Al's digging - busy with his trench.

CAPCOM Okay, very good.

MITCHELL I'll go over and help him photograph it in a minute. It's not going in easy, Fred.

CAPCOM Roger, Ed.

MITCHELL I'll try driving it a bit more but I think I'm on solid rock. I'm about one core tube down.

END OF TAPE

MITCHELL solid rock and that's about one core tube down.

CAPCOM Roger, Ed. Solid rock about one core tube down.

MITCHELL Yeah.

SHEPARD Okay, the recommendation Ed is to pull it up and move over a bit a try it again.

MITCHELL The way it feels it'll be the same thing.

CAPCOM Okay, Ed when you pull it out they'd like to save the bottom core and replace it with another one there and before you try again.

MITCHELL Okay.

CAPCOM How's the trench going Al, are you getting down there.

SHEPARD I'm doing trenching - it's going fairly easily but I need the extension handle to get a deeper or so - a way to edge through that. I'm cutting in to the rim of a crater which is approximately oh, say, six meters in diameter, has a depth of about 3 quarters of a meter, and we're back in by one diameter away from the north GARBLE of triplet. Torch is going through at least the three layers that I can see. The flying burn surface dark browns, then a layer of what appears to be quite a bit of black and then a third layer of some very light material. And we should be able to sample all three of these.

CAPCOM All right, Roger, Al.

MITCHELL Core tube cap. Core tube cap on that sample, in an 18 N.

SHEPARD Roger, Ed.

PAO Considering the fact that Shepard and Mitchell are both working fairly hard at this stop at triplet. There heart rates are relatively low, Shepard reading 100, Mitchell, 110.

SHEPARD And a very interesting looking rock with the very fine grain crystals in it. It's a grand sample, Houston, from that same crater which I'm digging. GARBLE dark brown, dark bright fractured. Fracture phase is very light gray with very small crystals.

CAPCOM Roger, Al and if you can get any with your samples down in the trench itself that have any rock segments you might include those as part of your sample.

MITCHELL Was that it.

SHEPARD Put that bag back if you can, these are full.

MITCHELL Full measure.

SHEPARD Great.

MITCHELL Let me help you.

SHEPARD Okay, babies.

MITCHELL Are you about through with the extension handle or are you going to -

SHEPARD Go ahead and take it. I don't really need it to drive.

SHEPARD I'll go in and cut that baby a little. through here. Thank you.

SHEPARD Okay, Houston I know that you did not mention this quite clear. Down in this area before that was so obvious to us just below the surface up near the flank of cone, but it appears as though there's quite a bit - well it's relatively deep, as far as visual observation is concerned. And certainly not any would be picked up by footprints, or tracks or the like. But they are apparently out somewhere near the trench.
Yeah, in this trench.

END OF TAPE

CAPCOM Roger, Al.

MITCHELL Barry, did you get my report that the core tube tipped the tip was an 18 in?

CAPCOM Roger, Ed, I got that. 18 in.

MITCHELL Okay, now I have taken the bottom core of that one, which was core one five, and it's down about - as a single core tube, and I'm going to replace that with number one, unpegged which is the one Al started to use earlier but couldn't get anywhere with it.

CAPCOM Okay, number one, unpegged. Down at the bottom.

MITCHELL You know what's happening in this trench, it's the surface fines are so brittle that they're just falling down covering the coring that we want to get. I'll tell you we're not going to get a classic vertical wall here Houston, on this trench.

CAPCOM And Ed, are you having any better luck on the triple core this time?

MITCHELL I've got it in about half a tube. But I'm getting ready to take a picture of it so you can locate it, and then we'll go ahead and (garble) in.

CAPCOM Roger, Ed.

PAO We're at 3 hours 19 minutes since cabin depressurization and the clock counting down shows one hour 12 minutes to go.

MITCHELL Three frames here probably 69, 70 and 71. They are Core tubes the first one's the aborted one that I couldn't get in. The second one, the second picture is the - this new attempt and a fifteen foot shot, that I raised up and took a locator shot on the horizon of it. I think it might go.

CAPCOM Very good Ed.

MITCHELL Okay, I'm getting down low enough I'm going to have to have an extension handle to fnish driving it I think.

SHEPARD Okay, I'll give it back to you. I'm really kind of through with this trench.

CAPCOM Roger, Al.

SHEPARD Yeah.

MITCHELL That's it.

PAO Shepard has apparently completed his trench digging task which Ed Mitchell continuing his attempt to drive the triple core sample. The triple core tube.

END OF TAPE

SHEPARD Okay, Fred bag 19 for the sample of the surface mine That is from the surface layer of the trench.

CAPCOM Roger Al, bag 19 is the sample of the surface mines.

SHEPARD No, I was unable to take from the walls of the trench, the type of material, (GARBLE) type of material that I could see when I was digging, so I will get a thimble full of that, and it will make the surface with the second layer.

CAPCOM Roger out. How deep did you finialy in up getting down?

SHEPARD Well the trench is about a foot and a half deep. I gave up actualy not because it was hard digging, but because the walls kept falling in on it, and it was covering all the evidence of stratigraphy.

CAPCOM Roger Al.

MITCHELL Hey, Houston, I'm over 40 feet, 50 feet from where Al is, and on the east side of these craters I have the triple core in about a tube and a quarter, and its tighting up again, and I just don't think it going to go the rest of the way.

CAPCOM Okay, Ed.

MITCHELL I'm maybe driving a milimeter a stroke. I'll hit it a few more licks and see if we can break through or move it a little more. No, thats as far as it is going Houston, 1 and a quarter.

CAPCOM Okay, Ed, we'll just take your judgement on that, when you don't think you can get it in any further you can stop there.

MITCHELL Okay, I think I could possibly beat it for the next 10 minutes, Fred, and not get another inch out of it.

CAPCOM Well, I don't think you need the excercise, you may a well extract it now.

MITCHELL I agree, I'll take a picture of it, a final picture of it to show you how far we got with it.

SHEPARD Okay, Houston, this is AL and mag 21 is kind of a collection of the combination of the top 2 layers. Second layer is a thin layer of small glassy like pebbles, I was unable to separate that by the trench method, so I gave it to you mixed up in that bag, and the last bag will be the pebbles from the bottom layer.

CAPCOM Okay, Al, and about what is the thickness of the intermediate layer there?

SHEPARD Well, it's really a (GARBLE) very thin, I would say no more than a quarter of an inch thick, and I just noticed it because of the difference of the grain structure when I was digging the trench.

CAPCOM Roger Al.

SHEPARD And in bag 20 20, we'll build a ship over

SHEPARD the bottom material. Both so mixed up with the, some of the surface material has fallen down in on top of it. And that's about, call it 18 inches below the surfaces.

CAPCOM Roger Al, and when you and Ed can work it in we need another EMU check.

PAO Shepard, reading out bag location on print samples so while Mitchell stopping short on his triple core tube.

SHEPARD This is Al, at 3.75 and reading about -

MITCHELL Oh hell.

SHEPARD Reading 35, I have no flags, and I'm in up to mid flow and feeling good.

CAPCOM Okay, and let's see (GARBLE) Ed.

END OF TAPE

MITCHELL 375, 32 percent. In a moment I'll have minimum cooling, medium cooling and feeling great.

CAPCOM Okay.

MITCHELL My problem is I can't get the - starting - starting down to that rock, I couldn't get the core cap off. I'll have to get some help from Al soon as he puts his handfull of samples down. Looks - okay, that's great.

SHEPARD Okay, let me get rid of this pincher.

CAPCOM Okay. On the agenda, here, we have remaining documented samples and we need a pan.

MITCHELL All right, we'll get it for you.

SHEPARD Oh good.

MITCHELL Get another one, skip it, we've got plenty.

MITCHELL Look at it.

SHEPARD Yeah.

CAPCOM Okay. And Al, one question, did you get the SCSC sample out of the bottom of the trench.

SHEPARD Well, as I told you the trench was kind of a miserable failure, because the walls kept falling down, and I could get a sample from the bottom, but it wouldn't be the bottom, I'm afraid. Okay, Fredo, the bottom bit on this string, was bit 23.

MITCHELL (garble), Al? Which one did we get?

SHEPARD Twenty-three.

CAPCOM Roger.

SHEPARD All right, twenty-three. Okay, we need a pan from here, we can get that.

MITCHELL Okay.

PAO Shepard will perform the panoramic photography.

MITCHELL Okay.

CAPCOM And, Al, when you get done with the pan, I guess we'd still like the SCSC sample from the bottom of the trench, even though it probably isn't the bottom.

SHEPARD Well, I'll tell you, I'll go back there and whack in it a little bit, and see what I can do.

CAPCOM Okay. And Al and Ed, we have about 8 minutes left here at Triplet.

SHEPARD Roger. You're still counting on a quick trip out to the ALSEP antenna?

CAPCOM That's affirm, Al. That's included in this time, and when you start out, we'd like you to make some grab samples as you pass by north Triplet.

SHEPARD Okay.

MITCHELL And Fredo, the triple core tube, the second core didn't have anything in it. As soon as I opened it up, a little bit fell out and the second core tube is empty.

CAPCOM Roger, Ed.

MITCHELL Even though it drove down. Even though

MITCHELL it drove in about 3 inches, it didn't get anything.

CAPCOM Okay, Ed.

SHEPARD Okay.

MITCHELL Okay, I'll put a bit back on that one. Save it.

SHEPARD Okay, and when you get done there, Ed, I guess you can proceed with getting some documented samples before we have to depart.

MITCHELL Okay.

SHEPARD Okay. SCSC can. That's over in that pocket, right?

MITCHELL Yeah.

END OF TAPE

MITCHELL Okay, documented samples coming up.
SHEPARD These weights up on the rim here, Ed?
MITCHELL Beg your pardon.
SHEPARD These weights up on the rim here?
MITCHELL Yeah.
SHEPARD Document some of that. Here is a rock right here.
CAPCOM Okay, has Al moved over by the rim of north crater now?
SHEPARD Oh, no, we're still at the same place.
MITCHELL Stay here.
MITCHELL Al that's pretty well disturbed Al, I'll grab it - I'll grab it without much documentation.
SHEPARD Okay.
SHEPARD We're still hitting the ball in the trench for you, Fredo.
CAPCOM Okay, Al.
SHEPARD I'll read to you at trench.
MITCHELL They'll be picking up one of their so called whiter rocks, Fredo, near the area where Al is digging. Since it's already disturbed I'm not going to waste time on much documentation.
SHEPARD GARBLE.
MITCHELL Okay, that's going to the 25 GARBLE.
PAO Al Shepard, digging into the trench again in an effort to acquire a sample from the bottom. We're at 135 hours, 22 minutes, ground elapsed time, 3 hours, 33 minutes since time of cabin depressurization. Our countdown clocks shows 56 minutes remaining on this second lunar excursion.
SHEPARD Okay, we have about 3-1/2 minutes left at triplet.
MITCHELL Okay, we're packing up now.
SHEPARD One more documented sample.
MITCHELL Okay, there is a special request rather than grab samples at the north crater rim there, they'd like to get a documented sample of a partial buried rock.
MITCHELL Okay, I was going to try to get you one of those here but it looks pretty big. I think maybe I can get it any how.
CAPCOM Okay, Ed.
MITCHELL Oh, no.
MITCHELL GARBLE.
SHEPARD Oh, wait up.
MITCHELL What's the matter, Al. GARBLE.
SHEPARD Oh, that seal came off that thing.

EEND OF TAPE

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PAO Shepard reporting that his field protector came off of one of the sample containers.

SHEPARD Triplet here, and that one brief stop at the north rim to pick up one documented sample. And get on back to the LM area if we're going to pick up the remaining task there.

SHEPARD We're gonna pick up - okay.

SHEPARD Okay, you're right.

MITCHELL This documented sample that I got of the Bering rock, it's too big for a regular weigh bag. See what I can do with it. A regular sample bag. I'm sticking one over it, but it'll never close. Okay, it's going in it. And will probably stay, but it wont close it.

CAPCOM Okay, that'll be alright, Ed. We're going to have to move out now.

MITCHELL It's (garbled) 26 in.

CAPCOM Okay Ed.

MITCHELL Okay. I'll get a move on, we're on our way. Oh I hate that son of a bitch.

SHEPARD They're miserable, aren't they.

SHEPARD Okay.

MITCHELL Let me grab it for you.

SHEPARD Got everything?

MITCHELL Yep.

SHEPARD The (garble) scan?

MITCHELL Yep.

SHEPARD Did you get it?

MITCHELL Okay.

SHEPARD Never forget it again. Okay, head for the LM. We're probably about two minutes away from the LM, Houston.

CAPCOM Roger, Al.

SHEPARD Okay, everything's fine so far. Okay, we're

MITCHELL Think we're closer now.

SHEPARD Here's one.

MITCHELL It's right up ahead of us.

SHEPARD Could be.

MITCHELL Let's go a little bit to the north of the rim, I think.

SHEPARD Yep.

MITCHELL We're approaching Triplet from the east Triplet from the east. There's a little rock field down here, small boulder field, Al. Want to get a documented sample from?

SHEPARD Okay.

MITCHELL Looks good, yeah. looks like it comes from there.

SHEPARD Oops

MITCHELL Did you lose something?

SHEPARD Just lost you know what.
MITCHELL Oh, no, what?
SHEPARD This shiney can.
MITCHELL The SCS 3 huh?
SHEPARD Okay, the shiney can is retrieved. Press on. (Garbled) down the middle and get a documented sample there. Man, that pile of rocks is beautiful, right to your left. Oh, just the right size.
MITCHELL Okay.
SHEPARD Don't walk over 'em.
MITCHELL No, I'm trying to stay away from them.
SHEPARD There you go.
MITCHELL Are these the ones, the ones over there?
SHEPARD Yeah.
MITCHELL Where?
SHEPARD Ooops - Damn that thing.
MITCHELL Okay.

END OF TAPE

MITCHELL New moon is in place.

SHEPARD Okay, why don't - I'll get the -

MITCHELL Go ahead, I'm on this side. I'll get the stereo.

SHEPARD Okay.

MITCHELL Got the locater.

SHEPARD Yeah. Okay you see the camera starting.

MITCHELL Yeah, that's got so much dirt on them. Okay, 7 foot.

CAPCOM Okay, Ed and Al, it's time to wrap this one up, there, you're going to have to press on back to the LM, or we're going to be really tight on the close out.

PAO Shephard, Mitchell now working at the rim of north crater.

SHEPARD Everything deployed, huh?

MITCHELL Yeah. God damn, it's bigger than what we thought. Al, are we going to prepare and sample that one. I'll get you another one here.

SHEPARD Okay. Listen, just put it in that - in that thing. Yeah, that's past maneuver at the time.

MITCHELL All right. I'll grab it, let me take a picture, an extra picture here.

SHEPARD All right. Looks like we have one right here in the foreground. I'll take it. Okay, bag 27 Nancy.

MITCHELL We have another documented sample - a larger documented sample than we thought we were getting here Fredo. Again, it was a buried rock and it's too big for the sample bag, so it will go into the weigh bag.

SHEPARD It'll go in that one right there. Can you get it?

MITCHELL Yeah.

SHEPARD Okay.

MITCHELL It has a very definite shape and I think you'll be able to sort it out.

SHEPARD Okay.

MITCHELL Okay, let's march for the LM.

CAPCOM Okay, Al and Ed, I guess we can skip the rim of the north crater and proceed right on back to the LM area.

MITCHELL Okay. That's where we are. We're in- we are in the rim of North crater.

CAPCOM Okay.

MITCHELL We're on the west -

CAPCOM I think you misunderstood the message. We can proceed right on by the rim. We have the buried rock samples now and head on back to the LM. That's the Antares

MITCHELL That's right. That's where we're headed.

SHEPARD Okay, that's where we're headed.

SHEPARD Hold it.

MITCHELL I'll get it, keep going. He lost the core tube.

SHEPARD Okay. Got it?

MITCHELL Yeah, I'll have it in the minute. I got it. Hmmmmm. Okay.

PAO Shepard, Mitchell heading back now to the vicinity of the lunar module, Antares.

SHEPARD Are you still hanging on?

MITCHELL Yeah, I've reached the lip.

SHEPARD Good.

SHEPARD Okay, we're approaching the LM now. Coming in at Fra Mauro base.

CAPCOM Roger, Al, and I guess it's here we'll - we can split up and Ed can take the MET and proceed to the cluster of bolders he reported earlier to the north of the LM and you can proceed out to the ALSEP.

MITCHELL Okay.

SHEPARD I'd suggest - you can do it the way you want to, I guess you can do without the rim.

MITCHELL Fill up the MET, yeah. (garble) the MET because there's nobody to - if anything falls off we've lost all those goodies.

CAPCOM Okay, that's

MITCHELL Might be able to take a couple of rock bags, put on my tongs and camera and go.

CAPCOM That's just fine, Ed.

MITCHELL Okay, Al's on the -

MITCHELL Okay, Al's on the -

END OF TAPE

MITCHELL Okay, Al, I'm on my way out to the ALSEP. As a matter of fact, Fred, I'm just going to take a weigh bag and no sample bag, that way I can get more. The size of these rocks, the sample bags are too small anyhow.

CAPCOM Roger Ed. Okay Al, the first thing when you get to the central stages -

SHEPARD GARBLE

CAPCOM is to check the alinement and verify the alinement and leveling.

SHEPARD Okay, I'm just going to go through the same procedure.

CAPCOM Okay, and I got -

SHEPARD GARBLE

CAPCOM you on the instrument.

SHEPARD I may give you a call when I get there and when I'm alined and level

MITCHELL Okay, Fred, on my plan, I'm out in the area of the boulder field, I'm going to photograph many of the boulders, the rocks, the broken ones , the big ones what have you, and then grab as many of the different fragments as I can around these piles of broken boulders. Now that I'm here, I see a large number of inclusions, I can't tell whether they're crystals or not, I think that they are. And I'll grab as many of these and give you the before and after shots as I can, fill the whole weigh bag full of rocks.

CAPCOM Okay, Ed. that sounds great.

MITCHELL Okay, the center alinement on the ALSEP has changed very little. There ought to be a slight change on bubble level, stand by.

CAPCOM Alright then.

SHEPARD Okay. Looks alined and level.

CAPCOM Okay, Al.

SHEPARD Fred, did you read?

CAPCOM the a -

CAPCOM 16.00

SHEPARD minus 6 00. Okay 16.00.

CAPCOM Okay, would you verify elevation and its still at 6.41?

SHEPARD 6.41, still elevation.

CAPCOM Okay, stand by one, out.

SHEPARD Standing by for Houston, standing by.

PAO That's Al Shepard alining the ALSEP antenna at this time.

CAPCOM Okay Al, you can proceed back to the vicinity of the LEM and with the time remaining that you had for the ALEP, shoot a few close ups pictures here. You've got about 12 minutes left.

MITCHELL Okay, are the ALSEP signals satisfactory?

PAO Mitchell surveying the boulder area north of the lunar module Aquarius.

MITCHELL Okay, getting back to the LEM.

END OF TAPE

CAPCOM Al, this is Houston.
SHEPARD Go ahead Houston.
CAPCOM Okay, a little change in the - when you get back to the LM, we'd like the TV turned to look at the MESA area so we can watch the close out number one, and then you can shoot a quick picture of the solar wind.
SHEPARD Roger, I'm going by the camera now.
CAPCOM Okay.
SHEPARD And we had peak setting down so it should be a good shape when you turn it to the MESA.
SHEPARD Okay, we'll be setting at 22.
CAPCOM Okay, a little more to the right Al.
SHEPARD Yeah, I'm just setting it up for Ed.
CAPCOM Okay.
SHEPARD Okay Ed, trip 22.
MITCHELL How does that look?
SHEPARD No, two more and point to the left just a minute. Setting of 22 at peak.
PAO Al Shepard positioning the camera
SHEPARD How does that look?
CAPCOM Okay, now if you tilt it just up slightly. Al, that'll be it. That's good, you've got good (garble) on it.
SHEPARD Okay, how's that.
CAPCOM Up, okay that's great, you can go shoot the solar lens now.
MITCHELL (garble) the soil is a problem out here. Okay, I'm heading back out to the boulder field. I've sampled two of the larger boulders in the area. Rocks broken from them and lying on them, I've taken a bag and I have a maybe a third of the way back full of small rocks. From the boulders.
CAPCOM Okay, very good Ed. We need to proceed now with the regular program.
MITCHELL Okay.
SHEPARD Okay, what setting would you like that solar wind shot?
CAPCOM Standby.
PAO That was Alan Shepard moving across - our picture to photograph the solar wind composition experiment.
CAPCOM Okay Al, I'd go ahead and use your standard down (garble) picture if that is direction you're shooting it in, they don't have an input here. Okay, the last -
SHEPARD Alright.
CAPCOM Okay, the last just got an input they want F11 at 122.

SHEPARD Okay.

END OF TAPE

MITCHELL Okay, will do.

PAO That's Ed Mitchell in the picture now with his bag of rocks.

CAPCOM And, Al, Houston.

SHEPARD Go ahead.

CAPCOM Ed I'd like for you to return your camera so that you don't have to bother moving the magazines from it. You can just put the whole camera into ETB.

MITCHELL Roger.

CAPCOM Okay, I guess so you don't get confused that means we'll be bringing back smoke camera.

SHEPARD Don't touch that.

MITCHELL Okay. Now the camera is in and magazine GARBLE says 100 and five.

MITCHELL Come back, Houston. I understand now. The contaminated sample under quad 3 about to be taken.

SHEPARD That's affirm, Ed.

MITCHELL Okay, I'm putting my camera in the ETB.

CAPCOM Okay, Ed, Houston.

SHEPARD GARBLE.

SHEPARD Go ahead.

CAPCOM Do I stand corrected what they really wanted was to bring Al's camera back instead of yours so we'll only be bringing the one camera, the CDR's.

SHEPARD Okay, Ed.

SHEPARD Yeah, give me this now.

MITCHELL Garbled

SHEPARD Fredo, correct me now, bag kilo kilo has never been used is that correct?

CAPCOM Standby.

SHEPARD Houston, while you're looking that up you might recognize what I have in my hand as the handle for the contingency sample return and just so happens to have a genuine six iron on the bottom of it. In my left hand I have a little white pellet that's familiar to millions of Americans. I drop it down. Unfortunate the suit is so stiff I can't do this with two hands but I'm going to try a little sand trap shot here.

MITCHELL Hey, you got more dirt than ball that time.

SHEPARD I got more dirt than ball. Here we go again.

CAPCOM That looked like a slice to me Al.

SHEPARD Here we go. Straight as a die - one more.

END OF TAPE

SHEPARD miles and miles and miles.
CAPCOM Very good Al. And answer Ed's question earlier there, (garbled) was used for the window shot Ed, so you ought to bring it back.
MITCHELL Hey Houston, we (garble) didn't we.
CAPCOM Yes.
MITCHELL Okay.
CAPCOM (garbled) Ed.
MITCHELL Putting zoom on the (garble) position. Down in there. (garble) 17 to me.
PAO So that last scene now, Al Shepard becomes the first lunar golfer.
CAPCOM Okay Ed, Houston.
MITCHELL Okay Houston, go ahead.
CAPCOM One additional item on your return is to bring back the hundred foot tether, that should also go in the EPB.
MITCHELL Okay. There is three and then three frames.
MITCHELL Okay, the close up camera cassette is removed, Fred.
CAPCOM Roger, Ed.
MITCHELL It's stowed. Now go ahead.
SHEPARD Houston, do you read me?
CAPCOM Loud and clear Al.
SHEPARD Yeah, okay. Okay, tell me about this tube, Ed. Does it have anything in it?
MITCHELL No, that's one that has nothing in it. Now before you throw it, get the number. That's two that we didn't get anything from.
SHEPARD Okay. Okay (garbled) control sample and we have four core tubes.
CAPCOM Roger.
SHEPARD And let's see -
PAO We're at the 135 hours 53 minutes GET, and at 4 hours 5 minutes since the time of cabin depressurization.
SHEPARD We have one SCSC. Get it in without dropping it again.

END OF TAPE

MITCHELL (garble)
MITCHELL Okay, where's the SWC bag.
SHEPARD It should be in the top of the MESA, Ed.
MITCHELL Also in the SRC, we have ABM over that. On the way back, would you move the documented samples?
CAPCOM Roger out.
SHEPARD That's closed. Close the bag. That pump goes in too?
MITCHELL No, it goes in the EGB.
SHEPARD Okay. Pick up the cord tubes then maybe.
MITCHELL Okay, get the rocks here. (GARBLE)(GARBLE) Didn't get anything in that magnitic sample container did we?
SHEPARD No, we did not. CDS's stuffs up there.
MITCHELL I've got it.
SHEPARD Good.
MITCHELL Your feet are about to get tangled up in the TV cable at the end of the wall.
SHEPARD Okay.
MITCHELL Yea, I think its up. Try it. (GARBLE) Turning in samples scratch, 30 mm camera mag, 16 mags, close up camera mags, EDS magnitic samples, we didn't get a magnitic sample. Say, are you going to have any way bags.
SHEPARD Yea, we're going to have some way bags. These 2.
MITCHELL Okay, here you go. Okay.
SHEPARD Okay, Houston, that completed the FFC 1 and then we have the, we're going to control sample 1 FC of C container, put 4 tubes in one bag of docking lab samples.
CAPCOM Roger out.
SHEPARD Okay now can you fit.
MITCHELL This in what?
SHEPARD This rock in this bag if you put it this way.
MITCHELL Okay, give it a try. Wait for me there just a second so I can repeat that.
SHEPARD Well, it won't go.
MITCHELL All right, we need to put the D 27 bag right?
SHEPARD Yea. You put that in the way bag and pick this up with it.
MITCHELL Okay, I'm getting you a bag for it.
SHEPARD Okay, we'll use that one then. (GARBLE) to build a AGB. Made it fix and hold there.
MITCHELL Lets get -

END OF TAPE

MITCHELL How are you fixed to (garbled)

SHEPARD I'm getting loaded. We'll probably have to make two trips.

MITCHELL Okay.

SHEPARD That baby's right here so we go, now.

PAO The 100 foot tether being brought back, this to tie down some gear. The present plan is to bring back the probe. We're at 135 hours, correction, 136 hours, ground elapsed time and we show 4 hours, 11 minutes since time of depressurization.

MITCHELL Okay. I put that (garbled) back on.

SHEPARD Thank you.

MITCHELL That will be a separate (garbled) by itself.

SHEPARD Why don't you.

MITCHELL Hold it up. Okay. Now have you got everything, Al? Got all the other dirt here.

SHEPARD Yeah, let me do one more check Maybe get some more in this bag.

MITCHELL These weigh bags are - you're going to make a separate trip out of them, huh?

SHEPARD I guess we'll have to, Ed.

SHEPARD I sure can't get it in there now.

MITCHELL Okay.

SHEPARD How much time have we got? We should be in pretty good shape.

SHEPARD Houston, how much time do we have left?

CAPCOM Standby Ed. Okay, we've got about 18 minutes now.

SHEPARD Oh, we've got lots of time, okay. Watch your feet again.

MITCHELL Okay, roger.

SHEPARD Okay.

MITCHELL Do you have the ETB's ready?

SHEPARD ETB stowed.

MITCHELL How are the SRC's doing?

SHEPARD Okay.

MITCHELL Now let's see what we have left.

SHEPARD That's the greatest javlin throw of the century.

MITCHELL I believe it is.

MITCHELL Old lefty himself, outstanding. Right in the middle of the crater stayed stabilized.

SHEPARD Wasn't bad at all - beautiful. Beautiful.

SHEPARD Let's look at a documented sample bag.

MITCHELL Okay, we missed one there didn't we.

SHEPARD We'll put that in the weigh bag.

CAPCOM Okay, Ed I didn't hear the solar wind call of there. Did you get that one, too?

MITCHELL Yep.

MITCHELL Step right in for ETB now.

CAPCOM Okay, and did -
SHEPARD Let's have these three weigh bags now
CAPCOM Okay, did the 100 foot tether also get to the ETB.
SHEPARD That's affirmative it did.
PAO That javelin looking throwaway item is possibly the solar wind pole.
MITCHELL Okay, we'll take those along.
SHEPARD Yeah, how will we handle them?
MITCHELL I'll put them in the inner ship.
CAPCOM And Al and Ed I just wanted to pick once again on the camera mags to make sure you got 4 70's and 4 16 millimeter mags. I just wondered if that (garbled) is on the camera.
MITCHELL That's affirmative. GARBLE.
CAPCOM Okay.
SHEPARD I think we've cleaned it all.
SHEPARD Okay, let's press on. You want to -
SHEPARD Want to head on up the ladder. I'll hand you the - SRC.
MITCHELL I believe it you'll stomp your feet on the way up it'll be as effective as the brush was yesterday.
MITCHELL Okay.
SHEPARD Okay, I saw you over here did you get a picture?
MITCHELL I did.
SHEPARD Of the LM in the foreground?
MITCHELL Yeah.
SHEPARD Yeah. Okay, ready to go up?
MITCHELL Sure.
MITCHELL Okay, Fredo, I'm starting up the ladder.
CAPCOM Good.
PAO Mitchell going up the ladder now.
MITCHELL How's that doing?
SHEPARD Looks good.
MITCHELL I've got a LM.
CAPCOM Okay, starting to get part of the cable over here so that -
SHEPARD Well, we finally did it to you, sorry.
CAPCOM Okay.
SHEPARD Come on I'll set it up - I'll go set it back up again.
MITCHELL Good. Okay.
SHEPARD Okay, fixing the television camera.

END OF TAPE

SHEPARD Okay, picks up the television camera.
PAO Shepard uprighting the television camera, which was knocked over.
SHEPARD Okay, Fred, we're going to have a real practical problem here. Probably be able to see what the lunar dust does to a camera lens.
CAPCOM Okay.
SHEPARD Same as back at the LM. Do you see anything at all?
CAPCOM Yeah. I think it's a better picture. Lunar dust helps the TV picture, I guess.
SHEPARD (laughing) Okay, we'll see to it that a little TV lens will get dusted in the future, if - cut you down four stalks, Fred.
CAPCOM Yeah, that looks - yeah, it's just about near the center, there. That's good, Al.
SHEPARD Okay.
MITCHELL Did, you see that mighty leap, Myrtle?
SHEPARD Okay, Ed, you can start on up now,
MITCHELL I'm already half way up.
SHEPARD Okay, good show.
PAO Mitchell's heart rate going up the ladder, 114.
SHEPARD Okay.
PAO Shepard's heart rate now reading 108.
SHEPARD How are you doing?
MITCHELL Fine. Figure from my (garble) I'm doing fine.
SHEPARD See.
MITCHELL How far back do I have to look.
SHEPARD This far.
MITCHELL Look up there.
SHEPARD Yeah, say about there.
MITCHELL Hell, I'm looking the wrong way.
Shepard Okay, shall we press on?
MITCHELL I'm second. There it is.
SHEPARD We've got to move on to the TV.
MITCHELL Okay. I've got it.
SHEPARD Okay.
MITCHELL It's good to have a quick look at Earth from the surface
SHEPARD Yeah. Oh we have some pictures of the LM in the foreground, so hope it comes out alright.
MITCHELL Pretty small sliver left, isn't it?
SHEPARD Yeah. Not much.
SHEPARD Okay, why don't you take the first ETB as soon as you're ready, then we can run the tracker light thing in between. Okay, stand by. You ready for it? Read me, Ed?
MITCHELL Okay.

APOLLO 14 MISSION COMMENTARY, 2-6-71, 628 CST 136 06 GET, 452/2

SHEPARD Houston, do you read?

CAPCOM Roger, Al. Houston reads you loud and clear.

MITCHELL Read me, Al?

SHEPARD Yeah, I read you Ed.

MITCHELL Okay, I'm ready to bring it up.

SHEPARD Okay, stand by. I'm going to get around a little bit more here. Okay, let her go.

PAO The transfer by conveyor belt now in progress. Moving materials back into the lunar module, Antares.

PAO That's Al Shepard on the lunar surface, Mitchell in the LM.

SHEPARD Very good.

END OF TAPE

SHEPARD Fredo, is the ALSEP antenna still doing okay?

CAPCOM Standby Ed. Roger Al, they're getting good signals.

SHEPARD Okay, that's good.

MITCHELL Okay Al, bring it down.

SHEPARD Alrighty, be right down.

PAO The transfer of materials to the conveyor belt is continuing.

SHEPARD Okay, hold it there.

MITCHELL Okay.

SHEPARD Okay, I have it. Little more.

MITCHELL Huh?

SHEPARD Little more down please.

MITCHELL Can you get it?

SHEPARD Yeah, I've got it now thank you.

SHEPARD Okay, you go in there. Okay.

SHEPARD Okay, that bag is so big it won't pull in the ETP very well I'll just bring it up by myself.

MITCHELL Okay. Go ahead and bring the other two up?

SHEPARD Just a second. Okay, you can take the string now if you like.

MITCHELL Okay. There she comes.

SHEPARD Okay, it's all yours.

MITCHELL Okay, I've got it.

SHEPARD Don't I kick the trunnion line before I come up?

MITCHELL Yep.

MITCHELL (garbled) out of the way.

SHEPARD I'm not looking at it. Tell me when you turn around.

MITCHELL Okay, I took a picture. The trip light's closed. Okay, here it comes.

SHEPARD Okay

END OF TAPE

SHEPARD Okay, let's see. Okay, track lights working.
MITCHELL Okay. Okay.
SHEPARD Okay, Houston, crew of Antares is leaving Fra Mauro base.
CAPCOM Roger Al, you and Ed have done a great job. Don't think I could have done any better myself.
MITCHELL That's debatable isn't it, Fred-O?
CAPCOM Well, I guess not now, Ed.
PAO Al Shepard preparing to start up the ladder now. Moving forward and -
SHEPARD Okay, the dust is knocked off.
PAO and with this close out, Al Shepard now at age 2 score and 7 years becomes the undisputed leader in time spent walking, working on the moon. More than 9 hours running a close second is, is his partner, Ed Mitchell.
SHEPARD How would you like one more bag of rocks?
MITCHELL Okay, if you'll take 1 LEC.
SHEPARD Okay. (Garbled) wait a minute (GARBLE)
MITCHELL Wait a minute. I just about shut.
SHEPARD Okay.
MITCHELL We're running out of room in here, Al. Take this while you at it before you come in.
PAO Al Shepard still passing equipment in, moving inside the hatch here momentarily.
MITCHELL Okay.
SHEPARD Okay, the (GARBLE) tank has already been discarded, Houston.
CAPCOM Roger out.
SHEPARD Okay, and -
MITCHELL (GARBLE)
SHEPARD That it.
MITCHELL No. Okay, now I've got it.
SHEPARD Put it on top of the pile.
MITCHELL Man, the pile is high in here too. Your ETB load and an SRC and an extra rock bag.
SHEPARD Okay.
MITCHELL Okay,
SHEPARD If you're ready, get over behind the door.
MITCHELL That's all of it. I'm moving out of the way.
SHEPARD I'll come on in.
PAO Shepard now ready to come inside.
MITCHELL Just let me close the door. Okay, I see what it is, is that -
SHEPARD (GARBLE)
MITCHELL Okay, Bring it down into detent.. My helmet back strap. Okay. And Al, it looks like a piece of velcro laying right in the door. Can you reach it before I pull the door closed? That's it. It's one of those off the MET.

MITCHELL Okay, come on in.
SHEPARD Okay.
PAO GET 136 hours 20 minutes, Shepard moving inside now.
SHEPARD (garbled) some more door more than that, Ed.
MITCHELL Alright, just a minute. Wait a minute back out Al, I've got to turn. Okay, now come on in.
SHEPARD Beautiful.
MITCHELL Okay, straight up. Straight up here.
SHEPARD Okay.
MITCHELL Fine shape.
SHEPARD Alrighty.
SHEPARD I keep hitting on something back here.
MITCHELL Okay, you hitting on the, (garbled)
SHEPARD Okay.
MITCHELL Now you seem clear.
MITCHELL Okay, Houston, the door is closed.
PAO 136 hours 21 minutes Mitchell reporting the hatch door is closed.
MITCHELL Water valve is closed.
SHEPARD (GARBLE) - the suits.
MITCHELL The feed water valve is closed.
SHEPARD Okay, let me go down and get the forward hatch and I'll lock it.

END OF TAPE

MITCHELL The front port hatch is closed
SHEPARD And locked
CAPCOM Okay, can you get the dump valve while you're there?
MITCHELL Yep.
SHEPARD Dump valve to auto
MITCHELL Dump valve to auto.
SHEPARD Where's that checklist.
SHEPARD (garble) each.
MITCHELL Okay. Hook up (garble) right.
SHEPARD Okay.
MITCHELL Okay, riding in the (garble)
SHEPARD Okay.
MITCHELL Cabin repress up turning trying to get (garble)
MITCHELL Cabin repress auto.
SHEPARD Okay, repress circuit breaker coming closed.
MITCHELL Pressure raising.
CAPCOM Apollo 14, Houston, do you have repressure.
PAO 136 hours 23 minutes and cabin is repressurizing.
SHEPARD Okay. (garble)
SHEPARD Okay, cabin at 2.5 (garble)
SHEPARD Okay, carrying line is up.
MITCHELL (garble) five pounds.
SHEPARD Building at 4.6.
MITCHELL Metric pressure right there
PAO The Telemu says that pressurization is looking good.
MITCHELL Okay.
SHEPARD Verify the EVA circuit breaker configuration.
MITCHELL Okay, that's good.
SHEPARD B minus (garble)
MITCHELL Two closed. Outside Delta V closed. The water sep component light, and have to go up. Got it up. Okay, we can doff gloves.
SHEPARD Okay, gloves off. Over to comp panels, verify the safety and dump valves.
MITCHELL Good, but -
SHEPARD Descent water valve open
MITCHELL Right. (garble) the water valve is open
SHEPARD Okay.
MITCHELL Okay, purge valve.
SHEPARD Let's see, have we got - okay. I just checked and rechecked to be sure we had everything.

SHEPARD Okay, (garble).
MITCHELL Okay
SHEPARD And disconnect the
MITCHELL I hope that's not the -
SHEPARD Oh yes it is. Somewhere.
MITCHELL Right there.
SHEPARD Okay, connect LM 02 to red to red, blue to blue.
MITCHELL pump off and fan off,
SHEPARD Stand by one.
MITCHELL Will you verify thise hose for me.
SHEPARD Okay.
PAO Apollo Control Houston, with Ed Mitchell and Al Shepard back in Antares.
MITCHELL Okay, they're locked.
SHEPARD Okay. (garble)
MITCHELL Pump off and fan off.
SHEPARD Good. Pump off, and fan off. That's good water from EVA. Get into (garble)
MITCHELL (garble)
SHEPARD Okay.
MITCHELL Is this your water?
SHEPARD And that's my water. EVA, do you want it too. I think I'm going to have quite a bit. Okay.
PAO Meanwhile Stu Roosa in Kittyhawk has completed a second run of Decartes photography.
MITCHELL Done it.
SHEPARD Yep.
MITCHELL Got that one.
PAO This task accomplished at 136 hours 21 minutes, again for this pass Roosa used the 500 mm Hasselblad camera.
MITCHELL It's a real picture.
SHEPARD Okay, Okay. close the LTC pump breaker.
MITCHELL LTC pump breaker is closed.
SHEPARD Okay (garble) to closed and connect the -
MITCHELL (garble) We'll do it together.
SHEPARD Yeah
MITCHELL We'll set the panels alike, and we'll talk and set it up.
SHEPARD Okay?
MITCHELL Okay.
SHEPARD Here we go.
ANTARES Houston, Antares.
CAPCOM Go ahead Antares.
ANTARES Okay, we're on spacecraft COMM now and proceeding with the PLSS OBS. Undock - undocking I should say.
CAPCOM Roger, Al.

END OF TAPE

CAPCOM Antares, Houston.

ANTARES Go ahead.

CAPCOM Okay, Ed. We want to check the ascent 02 pressure here before you get your gloves on to depressure. Would you give us a call prior to donning your gloves.

PAO This is Apollo Control, Houston. We're at 136 hours 49 minutes ground elapsed time. The crew aboard Antares very quiet at present. They're going through their flight plan items prior to depressurizing the Antares, again, opening the hatch again, and throwing to the lunar surface the disposable container and the portable life support systems, the back packs. We're at 136 hours 50 minutes and continuing to monitor. This is Apollo Control, Houston.

ANTARES Houston, we're getting ready to don gloves.

CAPCOM Okay, and Al, before you put your gloves on, I wonder if we could make this ascent 02 check, now? You ready to go?

ANTARES Tell me which one.

CAPCOM Okay. We'd like descent 02 closed; the PLSS fill open, and ascent 1 oxygen open.

ANTARES Okay. You have it. The descent 02 closed, the PLSS fill is open, and number 1 is open.

CAPCOM Very good, Ed, and stand by just a minute now and we'll get some readings here.

CAPCOM Okay, Al, and quantity looks good here, so we can turn ascent 02 off - ascent 02 - one to close, PLSS fill closed, and descent 02 back open.

ANTARES Okay, done. Sounds real good to us.

ANTARES Okay. Can we press on down?

CAPCOM Okay, press on. Thank you very much.

ANTARES Houston, Antares. We're depressing the cabin for jettison now.

CAPCOM Okay, Al, we're watching that and that's looking good. Suits are looking good.

CAPCOM Okay, Antares. Could you verify suit relief in AUTO, please?

PAO Cabin pressure coming down.

ANTARES Suit figure relief is now in AUTO.

CAPCOM Okay, thank you, Al.

PAO Telemu advises Flight Director, Pete Frank, the hatch is probably coming open now.

ANTARES Okay, Houston, we're going to jettison now.

CAPCOM Roger, Al.

PAO Both back packs jettisoned is very observable on the TV screen here at Mission Control.

CAPCOM Just heard the seismometer on those last ones.

ANTARES That's good.
ANTARES Good heavy throw.
CAPCOM We're hoping you cleared the velcro on those before you left.
ANTARES That's affirmative, we got it.
CAPCOM Great. Thank you.
PAO 137 hours 08 minutes and pressure coming back up in the cabin of Antares, now.
ANTARES Okay, Houston. EVA-2 post - is through.
CAPCOM Okay, very good, Al.
PAO This is Apollo Control, Houston. 137 hours 12 minutes ground elapsed time. The crew of Antares now stowing items for their later lift-off from the lunar surface.
CAPCOM Antares, Houston.
ANTARES Go ahead.
CAPCOM Rog, Ed. Troops on the ground here seem to think that the best place to stow that 100 foot tether will be over there in the left-hand stowage compartment.
ANTARES Okay. We've got quite a few things I think to stow here. We'll get with you and tell you where we're putting them.
CAPCOM Okay. Very good.
PAO This is Apollo Control, Houston at 137 hours 36 minutes ground elapsed time. Very quiet aboard Antares. Al Shepard and Ed Mitchell stowing the material and equipment that they have returned from the lunar surface, aboard their landing craft. The next point in our flight plan where we expect to hear more from them will be the post EVA debriefing. This perhaps 20 or 30 minutes away from this time. But for the present, the crew on Antares pretty occupied with their stowage and cabin clean up. We're at 137 hours 37 minutes ground elapsed time. Continuing to monitor, this is Apollo Control, Houston.
CAPCOM Antares, Houston.
ANTARES Go ahead.
CAPCOM Okay, I hadn't heard from you in a while, Ed. I was wondering how is things going?
ANTARES Well, we're pressing along, here. Fred. We're pretty well along in our stowage. And if you look at the surface checklist, we're at the top of the second column at page 75.
CAPCOM Okay, very good, Al.
ANTARES And we'll have a later report of the location of all the stowage for you here momentarily.
CAPCOM Okay.
ANTARES And then we'll probably eat and then we'll probably rest for awhile.
CAPCOM Sounds good.

APOLLO 14 MISSION COMMENTARY, 2-6-71, 655 CST 136 32 GET, 456/3

PAO This is Apollo Control, Houston, a ground elapsed time of 137 hours 58 minutes. That was Fred Haise speaking both with Ed Mitchell and Al Shepard. Our displays presently show a preliminary time for the lift-off of Antares, this at a ground elapsed time of 142 hours 25 minutes and 39 seconds, with a delta V of 6067.4 feet per second. This is planned to place Antares in an orbit of 52.2 nautical miles apolune, 9.2 nautical miles perilune. We're at 137 hours 59 minutes and this is Apollo Control, Houston.

END OF TAPE

ANTARES Houston, Antares.

CAPCOM Go ahead, Al.

ANTARES Were you planning on EVA-2 debriefing? If so, what time?

CAPCOM Okay, I guess whenever you're ready Al. Do you happen to have any weight check bars on the rocks?

ANTARES Affirmative. We gave you the weights - we gave you the weights of the rocks that we put in the left hand stowage yesterday. We have some additional rocks that are in the ISA. Total weight of the ISA is 5.0 pounds. Total weight of the SRC is 2.9 pounds and we have a couple of large rocks in that sample bag and that's B 27 and that weight is 3.0 pounds.

CAPCOM Okay, Al, copy that and looks like a pretty good haul.

ANTARES Yeah, it sure does. And we'll be ready for a debriefing in about another 10 minutes.

CAPCOM Okay, Al, just give us a call. We've got some of the questions ready here anytime you're ready.

ANTARES Okay, we'll give you a buzz shortly.

CAPCOM Houston.

ANTARES Go ahead.

CAPCOM Okay, just wondered are both of you still tied up with the stowage. Aside from the debriefing we do have a little bit of a steerable COMM check we need to get out of the way and if you are through, Ed, maybe we can tackle that now.

ANTARES Okay, Fredo, we're ready to go in through here in just one second.

ANTARES If you have plans or anything you can work with me on before the debriefing I'm ready to start.

CAPCOM Okay, I'll turn it over here to Joe and he can take - read you up this little test they want to do on the steerable.

ANTARES Hello, Houston, Antares, Joe do you read?

CAPCOM You bet, Ed, we're just getting switched around on the COMM down here and what we want to do, Ed, is to verify this acquisition and tracking capability. First thing we'd like to do is to go to the track mode switch to the SLEW position and slowly rotate the pitch knob over the entire range and and verify corresponding travel on the meters and also listen to the antenna driving if you can. After you've done that, we'll do the same thing with the YAW knob. So, first of all, go track mode to slew and rotate the pitch knob and see if you get corresponding travel and see if you can hear it rotating.

PAO That's Joe Ingle, back up lunar module pilot, speaking to Ed Mitchell aboard Antares. We're at 138 hours, 43 minutes ground elapsed time. This is Apollo Control, Houston.

ANTARES Houston, Antares.

CAPCOM Roger, Ed. Go ahead.

ANTARS Okay, I'm watching the antenna out the window - the shadow of it anyhow and the needles and it does drive over the entire range in both pitch and yaw. There's a great deal of undamped - well it's a lightly damped oscillation. It takes it quite a while to stabilize after you pick the particular setting of the thumb wheels but it eventually gets there.

CAPCOM Okay, very good Ed. Let's check the acquisition now. If you'll put the - set the pitch to plus 120 and yaw to minus 38 and you're in SLEW position and verify that you get a signal strength greater than 3.

ANTARES Okay, Joe, I've got a signal strength of 3.8.

CAPCOM 3.8 okay, very good. Now go to AUTO and see if the signal strength comes up any and also notice if you will that the pitch and yaw meters move any from your present position.

ANTARES Okay, the signal strength stayed the same and I'm indicating on the needles 130 and minus 40.

CAPCOM Okay, understand, 130 one three zero, and minus 40.

ANTARES Yesp.

CAPCOM Okay, and now standby -

ANTARES In flight, Joe, if you'll remember it. Let me say that in flight there were a couple of times it locked on beautifully however in order to get it to lock on I had to get the main lobe up. It would not lock on with just having signal strength up around 32 or 34. I had a signal strength up around 38, before I went to AUTO or if I went to AUTO with less than that it just drove off and went to the stop. Several times, however, it locked up and was tracking very nicely and then proceeded a few seconds later or a few minutes later to pop an antenna circuit breaker, so I think that it's over heating somewhere and either that or some problem in the electronics that's causing it to pop out circuit breakers.

CAPCOM Yeah, that sounds like a pretty good analysis, Ed, and standby just a second we'll have a couple of more little things to try here before we terminate this.

CAPCOM Okay, Ed now what we'd like to do is to let me read this through before you do each step but go back to the SLEW position and set the pitch and yaw angles the same as what you're reading now, on AUTO track. That's 130 and minus 40 and let's make sure that we're in that position.

ANTARES Okay, going into SLEW and selecting the front wheel position to match the needles.

PAO Apollo Control, Houston. What you are

PAO hearing is a communications checkout.

ANTARES It was pretty close that time.

CAPCOM Okay, very good. Now what we want you to do is to - while you're in SLEW position, try the pitch control off, rotate pitch control 8 degrees, clockwise, and then go by tech mode to AUTO and see if it will reacquire.

PAO A communications checkout involving the S the S-band steerable antenna on Antares. This is Joe Ingle in Mission Control speaking from the CAPCOM console. Ed Mitchell aboard Antares responding. We're at 138 hours, 49 minutes ground elapsed time. This is -

ANTARES I'm back in 8 degrees Joe.

CAPCOM Okay, beautiful. Let's go back to SLEW and set the angles up again at 130 and minus 40 and we'll do the same thing with the yaw control, we'll rotate it 8 degrees clockwise and then back to AUTO and see if it'll track back.

ANTARES Okay. GARBLE need to come back in Joe.

CAPCOM Okay. That's about all we can check, I guess, Ed. Let me give you a configuration that we'd like to go to in the event that we do have tracking problems during ascent because we would like to maintain high bit rate if possible. Let me know when you have a pencil out and a card that you can copy it on. Maybe the AGS - your AGS card there would be a good place to have it.

END OF TAPE

CAPCOM and for you information.

ANTARES Okay, Joe, I'm ready.

CAPCOM Okay, very good, I was just going to say there is only 5 items here so it wont be very much. We would like in the event that you do loose steerable now, we'll go down voice back up, BIO med left, audio mode to ICS first to talk, and to high bit rate. And of course we want aft OMNI during the ascent.

ANTARES Okay, I've got 4 of them, Joe. The next to the last one, Guess I don't have. Down voice back up, BIO med left, high bit rate, and what was the next to the last mode, and then aft OMNI.

CAPCOM Okay, audio mode to ICS first to talk Ed.

ANTARES Okay, ICS PTT.

CAPCOM Okay, very good, and that configuration only in the event that we lose track effect, with the steerable.

ANTARES Okay, will do Joe.

CAPCOM Okay, and thank you Ed. And I'll give you back to Fredo here.
Stand by just a minute.

CAPCOM And Antares, Houston, we're standing by with the debriefing questions here when ever you are both ready to go.

ANTARES Okay, we are ready to go right now, Fred-O.

CAPCOM Okay. Okay, the first question is to describe the texture or fracture pattern or any surface charactistics of the large boulders. In the boulder fields you were describing at Cone crater.

ANTARES You want textures and patterns of the boulder itself.

CAPCOM That's affirmative Al.

ANTARES Well we made some remarks as I recall coming back down about the fact that they looked weather beaten, and the fact that they maybe were fairly soft rocks, because they look very much like rocks that have been whether beaten due to atmosphere. I think that was one of the types of textures that we studied. Way down there were other rocks that were very fine grained and crystalline rocks and essentially very smooth on the outside. We have a sample of one of those. Football size. These are really the only 2 textures that I noticed. Did you notice any particular Ed.

ANTARES Well, no I can't say that I did specifically. It wasn't really a matter of being able to describe what we saw in this particular case, because at that point we were so rushed, that all we were trying to do was see different things and grab it with out really noting how it necessarily differs. The only thing that I recall about these craters, or rather boulders was that they were, there were inclusions or variations within the rocks, and I assume that they

ANTARES were crystals within the rock, or some crystalys forming in the rock. I don't know that thats true, they might have been, for example a breccia with not just a comglomerate in them, and I don't know whether thats true or not either. There simply wasn't time to look at them in that detail, so we just grabbed photographs and ran, and I would be kind of at a loss to give you an articulate discription of really what those rocks are like.

ANTARES I just think we have good samples of 2 types that we saw on the west rim of the crater. Ed got some small pieces light colored rock and we actually brought back one that was typical of the other, redish brown rocks.

CAPCOM Okay, Al, very good.

ANTARES I should say. Okay.

CAPCOM Okay, the second question was I guess one we passed some where along the way, and did you ever notice there being dust on tops of any of the boulders, around cone?

ANTARES Let me reastablish that Fred-O. I noticed some of the rocks, the smaller boulders that were closer to the ground were covered with dust, but I recall boulders that were not covered with dust, and for example, the boulders down here closer to the LEM, the last boulder field I went to did not have any reasonable dust on those rocks. And the white ones I sampled up near Cone crater, didn't have any reasonable dust on them, however, others did. As a matter of fact, there was one of the boulders in that group of the white boulders that I photographed for you, but it was too big to do anything else with, it had brown and white, and I couldn't tell what kind of a contact it was. Whether it was the white part was because it had been broken away or whether it was a contact of two different materials. It just wasn't time to investigate that sort of phenomena, so we tried to simply sample the two types and photograph it, but as far as dust is concerned, I think we've seen both and among the larger boulders, there are certainly a large number that do not have any dust on them.

CAPCOM Okay, Ed.

ANTARES And that's generally true. I think we probably wou have been aware of dust. I think again we to would have been aware of dust, there were certainly was a lot of (GARBLE) we tried document that for you. I'd say, generally speaking, there was no dust on any of them. On the surface of any of rocks that we saw.

CAPCOM Roger, out. And the next question when you were high on the slopes of Cone, could you tell any difference in the surface color tone, when you looked back in the area to the south and to southwest?

ANTARES Well, of course the obvious difference was the in the bright craters, those, those are always noticable, and those were there. Beyond that I wasn't aware of any marked contrast in color, Joe.

ANTARES Well, I don't know whether its a figment of my imagination or not, I've always, I always noted going up there this morning, or thought I noted, that the area around old nameless there were some darker patches, but we were so preoccupied with finding our way to the top of Cone crater, that I neither observed it or made remarks about that observation, nor really observed it that much more closly.

CAPCOM Roger Ed, hopefully maybe the pans will pick that up. Okay, next question on, this is for Ed, when you attempted the second triple core, and I think you really answered this in real time, but I just to get it straight, did you think you hit another rock, you mentioned bed rock on the first attempt, or did it just get progressively harder to drive?

ANTARES Well, I wasn't quite sure, Fred-O, I thought that I hit rock again, but I pulled it out, it could very well have been just a compaction type of phenomenon where it just quit driving, and I don't know the answer. It felt like in driving it, that I had hit something pretty solid, but it wasn't as though I had hit a very sharp line of rock as opposed to soft material. It went down fairly well, and then it tightened up and then it just stopped.

CAPCOM Okay, Ed. To back up, a little further back in time, we missed when the double core was, test was done, about how far could you push the tube down before you started hammering?

END OF TAPE

ANTARES And it's starting to vibrate and shudder a little bit and we're going to lose it in a minute; probably about the circuit breaker.

CAPCOM Okay, Ed, we're - we lost you there for a little bit. I guess you can, if you get it locked on, just leave it slow running on auto.

ANTARES Let's read on.

CAPCOM Okay, I didn't get the answer there, Ed, on how far that double core got manually pushed in before you started hammering on it.

ANTARES Al had the rest of that (garble). And I didn't put it in.

ANTARES Are you talking about the first one, Fred?

CAPCOM That's affirmed, Al.

ANTARES Okay. We were going, before that accident, into the vicinity of Point A. Went in about 2 to 2-1/2 to 3 inches; no more than 3 inches.

CAPCOM Rog, Al. If I can find the next question, I asked - this answer.

ANTARES (garble) cut out. It would be - what?

CAPCOM Go ahead, Ed.

ANTARES If they went that far, I'd be surprised, going back to it.

CAPCOM Okay, Ed. The question 5 is kind of the same as the first one and I assume your answer will probably be the same, but the question is could you describe and in any more detail, and I guess it's really saying did you think you saw any stratigraphy at all in the way the ejecta was laying around Cone Crater?

ANTARES I saw a couple of bolders that I thought had some stratigraphy in them, but it - well, now you know obviously in the classic that there was, well, as a matter of fact we took a sample from one that looked like it had some stratigraphy in it on the way back down. We grabbed a good sample from one. Well, it didn't jump out and become obvious, however.

CAPCOM Okay, and I (garble)

ANTARES But everything here especially seems to be pretty darn settled, and I am convinced there is stratigraphy there because we felt suggestions of it. Just like I'm convinced I see some lineations out here or some suggestions of it, but they don't jump out and hit you in the face and we'll probably have to go over the photographs and talk about each one of these samples in detail before we can really bring out the picture on it. I just can't remember a lot of those very subtle things.

CAPCOM Okay, and I assume, on a little bit larger scale, you couldn't detect anything with respect to the flinch, flat type relation in that bolder field around cone?

ANTARES No we sure couldn't see that at all. I'm sure it was there, if we just had time, but we couldn't see it.

CAPCOM Okay. And this one is for Al. About how deep were you down in the trench, Al, when the side walls started caving in?

ANTARES Well, actually, we (garble) our (garble) down to about 6 inches and there was some caving in at that time. The side walls were standing probably about 70 to 80 degrees. The next shot I took made the walls a little more steep closer to the vertical perhaps about 80 or 85, and at that point they started coming down. Fine grain regolith. At the top of the cut, just a couple down hill into the trench.

CAPCOM Okay, and I guess I asked you in real time the thickness of the intermediate layer, but they would also like to know if you have any estimate on the thickness of the very top layer.

ANTARES Well, I sure don't. It wasn't very thick, It could be in the classic ten because it all started to crumble after the first couple of strokes.

ANTARES That was the place where you, Ed, put the sample of the white colored material, it was very close to the surface.

ANTARES Is it the upper layers you're talking about, the brown is the next one and then the white. It seems - the brown seems to be showing the white in some places after an inche or 2 inches. I'm not sure it's another layer. But it had to be. I can't find another explanation for it, but it seemed to be very thin; one or two inches for top layers.

ANTARES I think that's probably a pretty good call. I'd say maybe 2 inches, and of course, we had that thin layer of very glassy material which I collected and then the bottom crater material which Ed got a sample of. That's while I was going back up.

CAPCOM Okay, and you've already answered the next part of this question, what was distinction between layers. You had both color and texture or distinctions there and it told you you had the layering, and I guess the last part maybe, you've answered too, but it's a question in whether the wall caving you think maybe was a natural event or do you think it was due to the dragging the trenching tool to the cut.

ANTARES Well, I'm not sure I had an unnatural shovel, and I'm not quite sure what's the question is now that I think back about it again what, you mean that -

CAPCOM Actually, I thought you answered that Al, because you -

ANTARES (garble)

CAPCOM Your previous comment indicated that it started caving in with your first stroke and if that was true then it looks like the trenching helped bring the walls down.

ANTARES Well, I'm sure that it did. Actually it was on about the second stroke where it started to cutting and the first strike there was a - the walls were a lot steep. But, I'm sure the tool had a lot to do with it.

CAPCOM Okay, the next question when we were sorta quickly passing by north Triplet crater on the way back to Antares, you mentioned, in passing there, coming upon a little boulder field and the question is do you think this boulder field was tied in some way to north Triplet; possibly part of a ray?

ANTARES Well, we probably just - just we inferred they were boulders, I think that we might be able to feel - feel them of ejecta material from that particular crater, and therefore we took some samples there. Is that the spot you are referring to.

CAPCOM Yes, that's it, Al.

ANTARES Yeah, if we inferred they were boulders, that was incorrect, they were just hand samples in approximately 8 to 10 inches, but all lumped together. They had been ejected from that crater and right in our path and we took a couple of samples from those; that area.

ANTARES As a matter of fact, there were boulders which we also thought came out of probably the same area, but there wasn't anything around the boulders that seemed small enough and obvious enough to grab on the run like we tried to do with this bunch of samples.

CAPCOM Okay. The next question is did you see any evidence of down-slope KREEP with respect to the Cone crater fillets you saw on the uphill side rocks?

ANTARES Yeah, I did, and I'm not so sure but what part of the delineation that I was talking about would not be found on Cone in a circular around - around the crater mouth. I saw the same -

END OF TAPE

MITCHELL I saw these same things up there. I described them before so I didn't say anything about it again, but my guess is that they go circular around cone crater. Now that may be entirely wrong.

CAPCOM You mean kinda like contour lines, ED?

MITCHELL That's what I'm suggesting but it's merely a suggestion. I didn't follow them out, I didn't check them that closely to be able to prove it but what I did see them. They were indeed, kinda parallel to the slope - I mean parallel to the rim of the crater, in other words, around the crater.

CAPCOM Very good, Ed. Next question, the difficulty you had at the last there climbing up to cone rim, was that due primarily to the terrain slope or did the soil conditions change again that might cause you to have some greater problems.

MITCHELL It was probably both. I think we just entirely underestimated the difficulty in going that far and getting that high, and in such a short period of time. It's a darn hard climb, to try to do rapidly and the soil is a little bit thin and mushy. And the suits are bulky, it's all those problems rolled in Fred, we just - it was too ambitious I guess.

SHEPARD Let me say that I don't really think that the composition of the soil changed very much. Matter of fact that was one thing that struck me about the whole area the consistency of the texture of the regolith outside of the soft area is of course it's crater rim. Yeah, I think as far as the progress up there - it was to the grade and the pull was in the rock that we had to go around but really as far as the surface texture is concerned as far as the bearing strength of the surface. I thought, outside of the crater rim, it was unusually consistent all the way through and the thing that surprised me was the pattern of - the raindrop pattern with these very small sort of pebbles. which is decidely different than we had down here in this area where we landed.

MITCHELL I think we remarked on the similarity of the surface, I think I remarked at one spot that it seemed to be getting a little harder up there, but that seemed to have been isolated. It wasn't true in general. Just it seemed to be in that one local area. And certainly as Al pointed out the softest areas by and large are crater rims, fairly fresh crater rims and when you run in through one of those you get fairly soft material but otherwise it's not like you saw here near the LM on television the way we were pressing into that.

CAPCOM Roger. The next question is how abundant and what was the distribution of glass that you saw around on the surface or I guess in once case you mentioned it

CAPCOM they're draped on the rocks.

SHEPARD Yeah, we went exploring past sun rock, well it looked like rock but I'm pretty sure that it was, and I'm sure there are other samples of that out here but we did not see them. The - that was really the only example of glass. They're like plots that we come close to possibly identifying to being glass. There are some crystalline rocks out here and I'm sure we got some samples for you.

MITCHELL I concur with that. I'm surprised that we didn't obviously see more glass. A lot of the smaller rocks that we did pick up that were sample size were so darn dirty that they may have glass in them, but they are just covered with it - this dirt which clings to everything. and about the big rocks, the big boulders that you asked about earlier are not covered in the same way, I don't know. Maybe some of them are but it really covers up what the rock is made of and probably obscured a lot of glass that we just didn't even see.

CAPCOM Okay, we need to make a quick COMM switch here. Ed, we're having trouble staying with you from Madrid. We'd like you to go from FM to PM.

ANTARES You got it.

CAPCOM Okay, how do you read now.

ANTARES Loud and clear, Fredo.

CAPCOM Okay, that was the reason for comm loss a little while back on the steerable. The next question here actually let's see, second ten - did you notice the dust adhering to the MET particularly and if so, what parts?

MITCHELL If you got direct hit with mud with this dust, Fred, if it's sprayed on something it seems to stick. It just covers everything. And, I'm looking down out the window at the MET, surprisingly enough, it doesn't look too bad. The fenders, the wheels, the lower part, the legs, the other, they're pretty covered with dirt and there's quite a bit spread up - splattered around a little bit, but it looks surprisingly good as a matter of fact, maybe it just doesn't have enough force surface.

CAPCOM Okay, Ed one more question here. You mentioned seeing rocks around the rim of north triplet, did you happen to get a look for enough down there to see if you also saw either blocks or gray patterns from center triplet crater?

MITCHELL Fredo, the - it's so darn umdulating here that was part of our problem. We couldn't even see central triplet crater. We knew it was there but you can walk in some of the undulations and get lost from each other if you're not careful. You just can't find where you are. And, we couldn't even see anything from Central triplet and know was from that.

CAPCOM Okay, and I guess just one last question here to clear up what ended up in the SCFC how did the bottom of the bottom of the trench, the question, this is for Al, did you primarily end up with fine grain or coarse grained material in the SCFC?

SHEPARD It's all fine grain material. Some of it is from the surface, and unfortunately when I opened the first canister the seal came off (garble) through the bottom so I had go back and regroup and get another one. Take another sample. But, I think, I got mostly from the bottom of the crater, bottom of the trench, however, it is all fine grain, there's nothing of any greater size.

CAPCOM Okay, that's about it. Thank you very much. You should think about getting breakfast now.

ANTARES Okay. Thank you.

ANTARES Okay, that was a good job of getting us sorted up there when we got behind the timeline and we appreciate that help.

CAPCOM Well, we thank you again for doing a great job, Al and Ed. I think we have picked up everything we needed there.

MITCHELL Gee, I sure hope so. It sure was a panic from our point of view.

CAPCOM Well, we kinda knew that before we got there.

MITCHELL There were some things that we'd like to have done. I think you're right, Fredo. There are so many things we'd like to have done, the many things to do, so many interesting things to look at here and we didn't even have the chance to scratch the surface. We hope we've brought back something that you can sort out as time goes on.

CAPCOM Well, it's a little bit better than that sand pile out behind the training building though isn't it?

SHEPARD Oh man, don't you know it. It really is. It's fantastic up here.

END OF TAPE

CAPCOM And Antares, Houston. We would like to try auto track again on the S steerable.

ANTARES You've got it.

CAPCOM Okay.

ANTARES And how is our, and how's our friendly Command Module Pilot doing. Is he going to be ready to pick us up with nominal launch time.

CAPCOM You bet Al, I've been talking with him all morning here, he's really whipping around getting a lot of pictures and a lot of land mark tracking. He said he's picked you up on two passes now, and he also saw the reflections from the ALSEP on his last pass or two there.

ANTARES Was he shooting section camera?

CAPCOM On one pass he was.

ANTARES What was his visual?

CAPCOM Just visual on his last pass though.

ANTARES Very good, how about the HYCON, did he ever get it going?

CAPCOM That's negitive.

ANTARES Roger that.

CAPCOM Yea, that's right.

ANTARES Around the, the ALSEP, from the top of Cone crater he's so bright it stands out like a little jewel, that suprises all that Stu could see it.

CAPCOM He was really convinced that's what he saw, and he didn't even know where it was, you know, and ask me where it was and came back and sure enough confirmed it and that's where it was.

ANTARES Very good.

PAO This is Apollo Control Houston, at 139 hours 25 minutes. Based on crew reports we have some admittaly preliminary gross estimates of lunar sample waits being returned in Antares, as our air ground permits we'll pass those along to you now. From yesterday's EVA we have in the, we have a weight of the sample return container, a total of 43 lbs. The container itself weighing 13 lbs, this would give a net weight of 30 lbs. In the two other areas we have a comprehensive contingency sample weight of 5 lbs, 2 football size rocks, weighing 15 lbs, which would give a net total from EVA 1, of 50 lbs. On the EVA this morning, in the sample return container, we have a gross weight, or total weight of 29 lbs. The sample return container weight 13 lbs, together to give a net weight of 16 lbs. The crew reported 30 lbs of material in the, on the B src bag, the bag is estimated to weigh 3 lbs, this would give a net total of 27 lbs. A report of 50 lbs was given in the interum stowage assembly. The interum stowage assembly itself weighs 5 lbs and its estimated there are 30 lbs of equipment along with lunar samples located here. This would give a net total of 15 lbs

PAO or a net total for this mornings EVA of 58 lbs combining the two we come up with a total net weight of about 108 lbs. We'll stand by and continue to monitor. This is Apollo Control, Houston.

ANTARES Houston, Antares.

CAPCOM Alright Houston, go.

ANTARES Okay Ron, tell them that this high gain antenna is setting here and kind of wobbling and making all sorts of racket when it should be setting very still and quiet. It was untill just a minute or so ago. That seems to be starting to go unstable or at least neturally stable and it's not driving wildly, but it's making a hell of a racket. It's just kind of wobbling, around the netural point.

CAPCOM Okay, Enco copies that, and we'll let you know.

CAPCOM Antares, Houston.

ANTARES Go ahead.

CAPCOM Okay, they've made some configuration change on the ground station hook up to you, and for some reason, they think that that may have helped your antenna chatter, or what ever, the thing seems to be steadier now?

ANTARES It steadied out for a minute or so, and now it's kicking up again.

CAPCOM Okay.

ANTARES Why don't they accept the fact that this damn thing is about to quit on us.

CAPCOM Okay, Antares, Houston here, they'd like you to go back and select the lunar stage of the errectable.

ANTARES Okay.

PAO This is Apollo Control at 139 hours 50 minutes. In mission control at this time flight director Milton Windler and the maroon team of flight controllers are coming on and getting briefed by the previous shift, preparing to take over here in preparation for the powered ascent from the lunar surface. That event to occur in about 2 hours 35 minutes, or at GET time of about 142 hours 25 minutes 40 seconds. There will be a Change of Shift Briefing news briefing in the main auditorium of the MSC news center. We estimate that the briefing will begin in about 15 to 20 minutes.

ANTARES Houston, Antares, we have the crews station, crews status report for you.

CAPCOM Okay, go ahead Al.

ANTARES Okay, on the VID commander 16052 LMP 7050. Negitive medication, we're all in excellent health and excellent spirit.

CAPCOM Okay Al, sounds great.

CAPCOM Antares, this is Houston over.
ANTARES Go ahead, Houston.
CAPCOM Roger, Antares your old maroon team on station down here. We'd like to go to the pre lift-off comm configuration as modified earlier to check out the high bit rate telemetry lock, over.
ANTARES Okay, stand by.
ANTARES Okay, Bruce, are you ready to try that.
CAPCOM Roger.
ANTARES Okay, here I come.
ANTARES Antares to Hosuton, how do you read Antares?
CAPCOM Okay Antares, I'm reading you loud with a good bit of back ground noise, on the circuit you might expect, but comm's okay.
CAPCOM Thank you Bruce and I'll return to the other set up.
CAPCOM No, negitive. We would like for you to stay in this configuration for the time being so we can see how comm and telemetry is holding up.

END OF TAPE

PAO This is Apollo Control at 141 hours 10 minutes and we're now 1 hour 16 minutes away from lunar lift-off, doing a change-of-shift briefing, we accumulated a fair amount of taped conversation with Antares on the lunar surface. We're going to attempt to play all of that tape back, however, if we see that we're not getting caught up or that we're getting further behind, we'll stop the taped playback, turn the remainder of the tape over to transcript and pick up live. Among the things that were discussed with the crew, that we have on tape, that we passed up a docking procedure for them. Now the nominal docking procedure will be for the crew in Antares to move up to the command module once they have gotten contact with the docking probe firm contact, they will thrust in the lunar module using the RCS thrusters for 10 seconds or until Stu Roosa reports an indication in the command module of capture, which ever comes first. The situation on the communications with Antares is roughly as follows: we still have some doubts about the lunar module steerable antenna. The inco reported a few minutes ago that he believes the steerable will give us lockon. We're going to lift off from the lunar surface using the steerable antenna, preferring to fall back on the omni antennas, if that becomes necessary. Now one of the primary things that we lose with the omni antennas is the ability to leave the microphones in the lunar module up high. Now, if we're on omni antennas, the crew will be advised to trigger the mike, using push-to-talk for communications with Earth rather than having the mikes up high for the full duration of the lunar ascent, and that, of course, would be the situation that we would be in if we're not able to use the steerable antenna throughout the lift off. We also passed up the pads to the crew for the lift off. The latest lift off time computed by the Flight Dynamics Officer is 142 hours 25 minutes 42 seconds. And we'll begin at this time to play back the tapes that we've accumulated being prepared to go to live comm if we see that we're not getting caught up.

CAPCOM Antares, this is Houston. Over.

ANTARES Go ahead, Houston.

CAPCOM Antares, Houston. We'd like you to return to the previous comm configuration utilizing the erectable antenna. Over.

ANTARES Roger.

CAPCOM Antares, this is Houston. How do you read?

ANTARES This is loud clippers.

CAPCOM Okay, Ed, whenever you all are through eating, would you give us a call, please, and I've got a bunch of cards to pass up to you.

ANTARES Okay. I'll be ready to copy here in about 30 seconds.

CAPCOM Okay.

ANTARES Okay, Bruce, what do you want to send me first?

CAPCOM Alright, Ed. We'll send up the ascent pad for the direct rendezvous, first. Over.

ANTARES Okay. Ready to copy.

CAPCOM Understand you're ready, Ed.

ANTARES That's affirmative.

CAPCOM Okay. Ascent pad direct rendezvous 142 25 4200, 55429, 00313, minus 0003, address 47 plus 37 741, plus 01757, plus 58 843, plus 56 968, plus 00 313, plus 01909, 937 143 10 5400, LM weight 10744, 34 417, Tig 1 rev late 144 plus 24 plus 04. Read back. Over.

ANTARES Okay. 142 25 4200, 55429, 00313, minus 0003, plus 37741, plus 01757, plus 58843, plus 56968, plus 00313, plus 01909, 143 10 5400, 10744, 34417, Tig 1 rev late is 144 24 04.

CAPCOM Antares, Houston. The read-back correct. Ascent pad for a coeliptic-type rendezvous follows when you're ready.

ANTARES Ready to copy.

CAPCOM Ascent pad coeliptic sequence: 142 28 1250, 55325, 00 380 minus 0004, address 47 plus 37741 plus 01757, plus 58614, plus 56968, plus 00380, the balance for the pad is NA. Read back. Over.

ANTARES Roger. 142 28 1250, 55325, 00380, minus 0004, plus 37741, plus 01757, plus 58614, plus 56968, plus 00380. And that next to the last one should be 5 - yeah plus 56968.

CAPCOM Roger. Read-back correct. And now I have the CSI PAD, itself, for you.

ANTARES Okay. CSI. Ready to copy.

CAPCOM Roger. CβI: noun 11 143 26 3660, noun 37, 145 11 3000, 0516 plus all balls, 02066, 03115, plus 0516 03115, plus 0516 plus all balls plus 001. Read back over.

ANTARES Yeah. Over.

CAPCOM Antares, Houston. Standing by for a CSI pad read-back. Over.

ANTARES Roger. noun 11 is 143 26 3660, 145 11 3000, noun 81, plus 0516, plus all zeros, and 02066, 03115, plus 0516, plus all zeros, and is it plus or minus 0011?

CAPCOM Antares, Houston. The last data was positive, that is plus 0011. The read-back correct. Over.

ANTARES Okay.

CAPCOM And, we're starting the up -

END OF TAPE

CAPCOM Uplink for you. I now have the consumables update.

ANTARES Ready to copy.

CAPCOM Roger. Consumables update for 140 hours even RCS alpha 80 Bravo 78 Descent oxygen 38 percent ascent tank 2 97 percent, tank 1 reading as invalid, but it's approximately the same quantity. Descent water 23 percent, ascent water 98 percent each, descent ampere hours 488, ascent 572. Read back. Over.

ANTARES Roger. 140 hours, RCS is 80, 78, descent 02 is 38, ascent is 97 percent, and probably 97 percent water is 23 ascent is 98, 98, ampere hours descent is 488, ascent is 572.

CAPCOM Roger. Out.

CAPCOM Antares, Houston. Ascent amp hours were 572. Is that affirmative?

ANTARES That's affirmed. Got it.

CAPCOM Roger. Then I've got an update to your time-line work and an update to the surface check list. Let's hold off on the surface checklist update, because the time-line book whenever you're ready.

ANTARES Okay. Go ahead, Bruce.

CAPCOM Roger. On page 14 of the time-line book.

ANTARES Okay.

CAPCOM Okay. Down immediately prior to the block that says 60 contact. We want you to insert a verb 48 DAP load, and in our want the DAP, we're looking for 13002 to give you 4-jet translation in the docking procedure. Over.

ANTARES Okay. I understand.

CAPCOM And immediately after the 60 contact lock, we would like to add in TPCA commander. Let me read through it once quickly and then I'll go through it again slowly if you want to write it down verbatum. TPCA commander: thrust plus X at contact until CMP confirms capture or for 10 seconds which ever occurs first. And then under confirmed docking with CSM change that to confirmed capture report to CSM. Would you like me to go through it a word or two at a time so you can write it out or do you just want to make a notation to that effect. Over.

ANTARES Now you want to confirm capture as plus X until barber pole or 10 seconds which ever is greater.

CAPCOM Roger. After contact.

ANTARES Which ever occurs first. Excuse me.

CAPCOM Right. Which ever occurs first.

ANTARES Right.

ANTARES Houston. Antares. Is my understanding that the docking originally will be tried in the nominal fashion. Is that correct?

CAPCOM Antares, Houston. This is a modification to the nominal procedure. We anticipate using it on the first attempt. If of course, Stu calls capture prior to the time that you start thrusting, why that would not be necessary. But nominally you would start your plus X thrusting when you have good solid contact.

ANTARES This is even on the first attempt at docking?

CAPCOM That's affirmative, Antares.

CAPCOM Antares, Houston. The computer is yours.

ANTARES Okay.

CAPCOM Antares, this is Houston. Over.

ANTARES Go ahead.

CAPCOM Roger. In your lunar surface book we're deleting the up link at lift off minus 35 minutes with no P22 required.

ANTARES Roger. Thank you.

CAPCOM And also in the surface checklist at on page 8-1 under your S-band COMM configuration that reads Antares S-band PM, primary, primary, voice, PCM off reset, we're changing that to PM primary, a down voice backup in accordance with the COMM configuration we've passed to you previously.

ANTARES Okay. We're going to lift off and data voice back up then.

CAPCOM That's affirmative unless we instruct you otherwise later on. And you can delete all reference that goes to the portable antenna - to the steerable antenna such as that found on page 8-6, for your tract mode auto and all that. Over.

ANTARES Gee, Bruce. I thought that we were going to go off the nominal and if we had trouble got to this new procedure.

CAPCOM Negative. Our baseline now is to lift off in this mode if we expect the OMNI COMM to improve as you fly through the profile and pitch over. Over.

ANTARES Okay. I understand.

CAPCOM And in this connection since you are lifting off in RCS PTT, we won't be monitoring the intercom loop within the cabin and we'd like to encourage you to comment freely on how things are progressing and read stuff out to us as the occasion seems appropriate. Over.

ANTARES Well, we don't want to comment freely, but we'll comment reasonably.

CAPCOM Roger, out.

ANTARES Okay, Houston. We're starting through our checklist and lift off now is 1:15.

CAPCOM Okay. Stand by, please.

CAPCOM Antares, this is Houston.

ANTARES Go ahead.

CAPCOM Roger. Having passed through the changes to the COMM configuration at minus 1 hour and 15 minutes, we'd like to hold off on going into the down voice backup mode and RCS PTT until lift off minus 50 minutes. That is just prior to the RCS hot fire check as we're advised that on Apollo 12, the hot fire check blew the erectable antenna over. If the erectable antenna is still standing up after the hot fire check we'd prefer to come back into the normal voice configuration until sometime shortly before lift off. Over.

ANTARES Okay, Bruce. Why don't you call the COMM in real time and we'll respond.

CAPCOM Willco, Ed.

CAPCOM Antares, Houston.

ANTARES Go ahead.

CAPCOM Okay. Latest revision to the communications plan. At this time we would like you to select the steerable antenna and auto tract mode and give us your evaluation of the amount of grinding and motor noise you get out of it and try form an opinion, whether we think it will be satisfactory for lift off. If it seems like it's making too much noise or behaving erratically at the present we will then go into the slew position on the steerable antenna, maintain time up until just prior to liftoff where we want to return to auto and it tends to make it in the auto position. If it proves unsatisfactory during ascent we'll request AFT OMNI down voice backup and RCS PTT. Over.

ANTARES Sounds good for me. Okay. Switching on.

CAPCOM Roger, Ed.

ANTARES Okay, Bruce. It's nice and quiet for the moment.

CAPCOM Okay. Very good, Ed. And - -

CAPCOM During ascent if you percieve that you've lost the steerable, why don't wait for us to call you to switch over. Over.

CAPCOM Roger.

ANTARES Houston, Antares. Are all of my AGS constance on page 8-5 good?

CAPCOM Stand by, Ed.

ANTARES Some of them are on the ascent pad, Bruce, but there's some that aren't.

CAPCOM Roger, Ed. Except for those values which are loaded on the pad, the ones you have on the checklist are good. Over.

END OF TAPE

ANTARES Okay, thank you.

ANTARES Houston, Antares, the rendezvous radar test is satisfactory.

CAPCOM Roger, Antares.

ANTARES Houston, are you ready for the out fire of the jets?

CAPCOM That's affirmative Antares.

ANTARES Houston, the antenna blew over.

CAPCOM Roger, Antares.

PAO Al Shepards reference to the antenna blowing over referred to the S-band errectable antenna on the lunar surface, and as on Apollo 12, when the crew fired the reaction control system jets to check them out, the thrust from those jets blew over the antenna. We're 53 minutes now from ignition, from lunar lift off. Progressing smoothly toward that event, about 10 minutes 25 seconds from reacquiring Kitty Hawk on its 31st revolution of the moon.

ANTARES Hey Houston, all 5 checks complete. We're satisfied here.

CAPCOM Antares, Houston. We concur at what you had from down here. I have your k factor update.

ANTARES Okay, go ahead.

CAPCOM Antares, Houston, k factor, 140, plus 00, plus 0036, read back over.

ANTARES K factor 140, 00, plus 0036.

CAPCOM Roger, and with respect to the com situation again Ed, if you have to switch to the aft omni antenna, prior to making the 30 degree yaw maneuver, delete the yaw maneuver. That is remain in the belly band. If you have to switch after making the yaw maneuver, do not change. That is remain with the 30 degree yaw, over.

ANTARES Okay, we've got that.

CAPCOM And for your information, due to the CSM orbit, which is currently about 61 by 5 by 58.2, we're anticipating a TPI burn Delta-v on the order of 100 feet per second, vice the lower 60 some feet, vice the 90 feet per second in the flight plan.

ANTARES Okay, we understand.

CAPCOM And for your information Antares, your thruster firings are also monitored by the seismometer. Your coming through loud and clear, over.

ANTARES That's good.

PAO This is Apollo Control at 141 hours 37 minutes, and we're now 48 minutes, 45 seconds from lunar lift off. The crew at this time, somewhat ahead of the flight plan, presently alining the platform, on their lunar module guidance system, this is the stable reference number which is used by the onboard guidance system in determining spacecraft attitude. This is Apollo Control. We're about 50 seconds now

PAO from reacquiring Kitty Hawk, the command module in its 31st revolution of the moon. We're using a dual capsule communicator set up in Mission Control at this time. Bruce McCandless is Capcom for the lunar module, Antares, and Ron Evans is Capcom for Stu Roosa in Kitty Hawk. At acquisition, Evans plans to pass along to Roosa, the fact that we do not expect to have manned spaceflight network relay of the ascent. Normally, when we have the high gain antenna operating properly on the command module, the manned spaceflight network would be used to relay communications from Antares to the command module. This will not be done because the command module high gain antenna is not locking up in narrow beam width. Roosa will get his communications from the lunar module, via the VHF communications circuit, which will be put into activation shortly after orbital insertion. And we have acquisition now of Kitty Hawk.

CAPCOM Antares, Ed, we'd like to get batch 5 and 6 on line now and 1 and 3 off if you can do it without interrupting the V57, over.

ANTARES Just 1 second. I'll be just a second, Bruce.

PAO This is Apollo Control. We're now 33 minutes from lunar lift off. Aboard the command module Kitty Hawk, Stu Roosa at this time is getting suited up, and Capcom Ron Evans has advised Roosa that he will be relaying on the separate air to ground link the progress of the lunar lift off. Ed Mitchell and Al Shepard aboard Antares on the lunar surface have just completed the alignment of their guidance system platform, and Capcom Ron Evans will be passing up to Stu Roosa some information on stowing the probe assembly in the command module. The plan is to return the probe and it will be stowed under 1 of the couches in the command module Kitty Hawk.

CAPCOM Antares, Houston, did you call?

ANTARES Negative.

ANTARES That was the other Antares.

CAPCOM Antares, Houston, we copy your address 47 and 53, over.

ANTARES Okay, thank you.

ANTARES Houston, Antares.

CAPCOM Go ahead, Antares.

ANTARES Do we want to stay with the computed 047 and 053, or shall I reload the pad?

CAPCOM That's affirmative Ed, and we're only reading 4 digits on the deta, is that 01706?

ANTARES That's affirmative.

CAPCOM Roger, up.

ANTARES What was the affirmative, to reload or to stay with what I have?

CAPCOM The affirmative was to stay with the computer values that are already in the computer.

ANTARES Thank you.

CAPCOM Antares, Houston.

ANTARES Go ahead.

CAPCOM Roger, you can take descent battery 2 off, as per the checklist. Keep descent battery 4 on line until our call, over.

CAPCOM Okay.

PAO This is Apollo Control at 142 hours. We're coming up now on 25 minutes until lunar lift off, things progressing smoothly at this time. Mitchell and Shepard aboard Antares have switched to the guidance program, in their on board guidance system program 12 which will be used in the powered ascent from the lunar surface, and the lunar module ascent stage batteries, batteries 5 and 6 look good at this time. The voltages are normally and they're sharing the load well.

END OF TAPE

PAO At this time aboard Kitty Hawk Stu Roosa is maneuvering the command module to the proper attitude for the LM lift off. He'll have the CSM apex pointed toward the lunar surface, and capcom Ron Evans has advised Roosa that the lunar module appears to be in good shape for lift off, with the one problem of the LM steerable antenna which may give some problem in tracking and if it does, we'll be switching to one of the omni antennas on the lunar module. This is Apollo Control at 142 hours 6 minutes we're coming up now on 20 minutes until lunar lift off, and aboard Antares, Shepard and Mitchell will shortly begin pressurizing the ascent propulsion system. Here in the control center, the large plot boards, which will be used primarily by the flight dynamics officer, and the guidance officer for the lunar ascent, has come up. One of these displays in particular will be crucial to the flight dynamics officer, and that's the display which shows him altitude versus the rate of altitude gain. FIDO will use this display in determining whether the LM guidance system is putting the proper amount of energy into gaining altitude as opposed to gaining velocity. Initially the engine will be putting a larger percentage of this energy into altitude gain, later on in the burn the LM will be pitching over and the rate of altitude gain should drop off as the velocity gain begins to increase at an ever growing rate.

ANTARES Okay, you understand we're standing by to pressurize the ascent helium.

CAPCOM Antares, Houston. You're go on that, one at a time please.

ANTARES Got you, will do. Okay, there's number 1, Houston.

CAPCOM Roger, stand by.

CAPCOM Antares, Houston, you are go on the 2nd. Antares, this is Houston you are go for lift off this pass, direct rendezvous, guidance control PNGS, over.

ANTARES Roger, go for lift off. Direct rendezvous, guidance PNGS.

CAPCOM Roger, out.

PAO This is Apollo Control, we're now 15 minutes from lunar lift off. Everything looks good at this time, and we've given the crew a go for a direct ascent rendezvous with a nominal lift off time. Our lift off time, 142 hours 25 minutes 42 seconds.

CAPCOM Antares, Houston. You can treat bats 2 and 4 for the checklist, over.

ANTARES Okay, here we go.

CAPCOM Antares, Houston. Both batteries 5 and 6 are looking good.

ANTARES Thank you.

PAO This is Apollo Control at 142 hours 16 minutes, and we're coming up now on 10 minutes until lunar lift off. It's been relatively quiet here in the control center, also relatively little communications with Antares at this time. The powered ascent burn, scheduled to last about 7 minutes 12 seconds. At the end of that burn we should have achieved a velocity of about 55 hundred 43 feet per second. The electrical systems engineer, here in the control center, for the lunar module reports that those ascent batteries on the LM, which were a source of some concern prior to the power descent and the landing look good at this time. This is Apollo Control, now 5 minutes from lunar lift off. Everything still looking very good for that lift off and direct ascent rendezvous. At the time of lift off Stu Roosa in Kitty Hawk should be about 67 nautical miles behind the lunar module, and I have orbit insertions on 7 minutes 12 seconds later. The command module will be leading by about 135 nautical miles. Shortly before lift off Shepard and Mitchell aboard the lunar module are scheduled to make a VHF voice check with Roosa in the command module. We're now coming up on 4 minutes until lunar lift off.

CAPCOM Antares, Houston, I'm mark at 4 minutes, stand by, mark 4 minutes.

ANTARES We're right with you.

CAPCOM Roger up.

CAPCOM And Antares, Kitty Hawk is trying to read you on VHF.

ANTARES Kitty Hawk, Antares, how do you read?

CAPCOM Antares, Houston, Kitty hawk is reading you 3 by on VHF.

ANTARES Roger. We're not reading him.

CAPCOM Okay, we'll pass that to him.

ANTARES And Antares is counting down to 2 minutes. 3, 2, 1, mark. 2 minutes and counting.

CAPCOM We concur.

ANTARES 400 plus 10,000. plus 10,000. Hey Houston, our acteron is on, the A and B lights are on.

END OF TAPE

MITCHELL Okay. 367 readout and - -
CAPCOM Roger. We confirm both systems on.
MITCHELL - - one.
MITCHELL There's our boy.
MITCHELL Reading you loud and clear, 45 seconds and counting.
SHEPARD Okay.
MITCHELL Hello, see you shortly.
MITCHELL Okay. DSKY is on time.
SHEPARD Have a nice cool one set up.
MITCHELL Okay. The abort stage is set. Ascent engine is armed. 6, 5, 4, 3, 2, 1, ignition.
MITCHELL What a lift off.
SHEPARD And lift off.
CAPCOM Roger. Ignition.
SHEPARD - - pitch over.
MITCHELL 10 seconds.
CAPCOM Roger.
SHEPARD Okay, baby.
MITCHELL pitch overs good.
CAPCOM We confirm auto ignition.
MITCHELL That's affirmative. Auto ignition.
SHEPARD And here we go on across cats paw. (Garble)
SHEPARD Bearing up good, Houston.
CAPCOM Roger. You're looking good from down here, Al.
SHEPARD Coming up on 1 minute.
MITCHELL Al -
SHEPARD 2, 1, Mark 1.
MITCHELL Mark 1. Little bit low and slow, but PGNS are -
PAO FIDO says we look good, all sources.
MITCHELL 623. Okay. PGNS and AGS together.
SHEPARD Okay. Yaw is complete, Houston.
CAPCOM Roger.
MITCHELL Take a look at the target again. 5429313. Targeting is still good. Okay.
SHEPARD 02.
PAO Trajectory looks good. We're at 12,000 feet.
SHEPARD 3, 2, 1, Mark 2.
MITCHELL (garble) H is right on. PGNS right on. PGNS and AGS are together.
SHEPARD Steering is good; PGNS looks good, Houston.
CAPCOM We copy, Al, and you're go from down here.
PAO Velocity 1100, altitude 1600 - 16,000 - -
SHEPARD Tight as a drum.
PAO Coming up on 22, 000 feet. The steerable antenna tracking very well.

MITCHELL Okay. The steering is still good, Houston, coming up on 3 minutes.
SHEPARD 3, 2, 1, Mark it.
MITCHELL Marked. 3 minutes. P supply is good, H dot is good, H is - PGNS and AGS agree. Okay. Ocillation in our RCS pressures, but I'm sure it's (garble).
CAPCOM Okay. RCS looks good from down here, Ed.
SHEPARD Steady 31.
CAPCOM And your go from the ground at 3 and 1/2. Everything is nominal.
SHEPARD Okay, Bruce. Looks good here.
MITCHELL Mark. 4.
SHEPARD 4.
MITCHELL Fire is good, H dot is good, H is good, AGS are right together.
CAPCOM Antares, Houston. You're go from the ground. Looking good.
SHEPARD Okay.
CAPCOM Antares, Houston. We show all sources, PGNS and AGS are in good agreement.
MITCHELL That's good.
CAPCOM Okay. 25 to go.
SHEPARD (garble) and the plane looks good.
MITCHELL That's good.
SHEPARD Okay. You can start your camera if you want.
SHEPARD We will be on five at 12:30.
PAO Altitude 47,000 feet now. Velocity reading 3500 feet per second.
SHEPARD And 553 to mark it.
MITCHELL 53. Fire is good, H dot is good, H is good, PGNS and AGS agree.
PAO About 65 miles to go. FIDO says we're looking real good.
MITCHELL Okay. Let's take one more at 6:30.
SHEPARD All right.
CAPCOM Antares, this is Houston. Let's take a look at -
MITCHELL - - 6:30 is what you said.
MITCHELL Okay.
SHEPARD Right.
SHEPARD Take a look at 85 reference 500 for a minute.
MITCHELL Okay.
SHEPARD (garble) 9 voice.
MITCHELL Okay. I'll stay with 500.
SHEPARD Okay. Very good.
MITCHELL You're looking good. There's 800. 750. 600. 550. 500.
SHEPARD (garble)
MITCHELL 350, 300, 250, 200, 150, 100, 80,

MITCHELL 60, 50, 40, 30, 10. Shut down.
SHEPARD Okay. We've had a shutdown on the -
MITCHELL Roger.
SHEPARD (garble)
CAPCOM - trim the PGNS all axis.
MITCHELL And those residuals are good.
SHEPARD (garble) shut unbutton push key release.
MITCHELL Hit probe -
SHEPARD (garble)
MITCHELL - - read your residuals. Minus .8.
SHEPARD Okay.
MITCHELL Pick it up when we sit down.
MITCHELL Bullseye Al, that looks good.
PAO FIDO says the burn looks good. We're shooting for a 51 by 9 orbit.
SHEPARD Minus .1, minus .4, plus .5.
CAPCOM Houston. We copy.
MITCHELL (garble)
MITCHELL Say it again, Al. Minus .1, minus .4, and Hold. Okay. Let's go to the checklist.
SHEPARD Okay. We can go ICDV.
CAPCOM Antares, Houston. There will be a tweak burn. It'll come up shortly.
MITCHELL Roger.
PAO That tweak burn will touch up the orbit to get us in the desired 51 by 9.
CAPCOM Antares, this is Houston. Tweak tig 1423651. Delta-V X minus 2.0, Y plus 5.0, Z minus 8.0 and this is it the nominal yaw 30 attitude. Read back. Over.
CAPCOM Antares, Houston. Did you copy the tweak burn. Over.
SHEPARD That's affirmative, Houston. We're seting up for it now.
MITCHELL Roger. 1423651. Minus 2.0, plus 5.0, minus 8.0.
CAPCOM Roger, Ed.
MITCHELL 3651, Al. Getting AGS set up for you. Which AG are you going to do first. Biggest one is Z minus Z. Minus 8.
CAPCOM X, Z, Y, Ed. X, Z, Y. Over.
MITCHELL Do X. Z, Y. Al, they want X, Z, Y. 51, 27 - -

END OF TAPE

ANTARES C1 20 seconds. That's minus 2. That is 2.0.

ANTARES Okay. Give it. B - if - minus 8, B minus 8 left turn z. One, two Mark 2 4 5 turn 6 7 1 foot more that's 79 that looks good. 471 out of plane is plus 5 right. 3 and 1/2, 4 and 1/2 that's great. Right there. Hold it.

ANTARES Hey Houston, bridge complete.

CAPCOM Roger, out.

ANTARES It's dear old P47.

ANTARES Okay. banked.

CAPCOM Antares, Houston. You're go for the APS TPI. APS TPI. Over.

ANTARES Roger. Thank you.

PAO That tweakling over performed with the reaction control system thrusters on the LM have put the spacecraft in the proper position for the transfer phase initiation and the direct descent rendezvous. We'll be standing by for the report from the FIDO on initiation time for the TPI burn and also the velocity required.

CAPCOM Antares, Houston. How do you read?

ANTARES Loud and clear, Bruce. I'll lock up for you - just we're so busy.

CAPCOM Aw Roger, reading you a second.

ANTARES We're locked up on the steerable.

CAPCOM Loud and clear, Ed.

CAPCOM Antares, Houston. No state vector updates are required. Over.

ANTARES Roger. Thank you.

CAPCOM And Stu reports he's having problems locking on in VHF.

ANTARES Okay.

PAO This is Apollo Control, at 142 hours, 43 minutes and we're now about 12 minutes 30 seconds from losing contact with the command module. We'll lose contact with the LM as it goes behind the moon about one minute earlier due to the fact that the LM is in a lower orbit than the command module, Kitty Hawk.

CAPCOM Antares, this is Houston. We believe that the command module VHF ranging lock problem may be due to conversation on the loop. Your conversation even over the intercom within the LM is enough to break it up and inhibit lock so maybe you can get Stu to give you a mark when he's ready to throw the ranging recess switch and then remain silent for about 20 seconds, both spacecrafts. Over.

ANTARES Roger. We understand. Give us a call Stu, when you need it.

PAO This is Apollo Control at 142 hours 46 minutes and we're now about 8 minutes from loss of signal with the LM. Stu Roosa aboard the command module, Kitty Hawk, now has gotten VHF lock up with the lunar module and has ranging to the LM and the lunar module is also getting range information on Kitty Hawk. The transfer phase initiation maneuver at about 100 feet per second will be performed while the spacecraft is behind the moon and when we reacquire they should be beginning the breaking phase on the direct approach to the command module and the final portion of the rendezvous and we'll begin station keeping as the spacecraft comes back around and into contact with Mission Control.

CAPCOM Antares, this is Houston. We've been informed that all systems are looking good, in particular batts 5 and 6 are normal and you're in good shape trajectory wise flying around the corner. We've got 6 and 1/2 minutes to LOS and we anticipate having a ground TPI solution for you prior to LOS. Over.

ANTARES Houston, Antares. I'm locked by a bad antenna breaker again.

CAPCOM Antares, this is Houston.

ANTARES Go ahead, Houston.

CAPCOM Antares, Houston. Request to AMP OMNI and low bit rate.

ANTARES Okay.

ANTARES You have it.

CAPCOM And it looks like your present attitude is blocking the steerable antenna from pointing at the earth.

ANTARES Maybe so but it's also popped a circuit breaker.

CAPCOM Roger. If it runs into a stop, I believe it will.

ANTARES It didn't. It popped just before it went to the stop.

CAPCOM Roger. Out.

PAO As you've heard in that last exchange with Ed Mitchell on Antares, we've had a dropout of the LM steerable antenna. We're now using the OMNI antennas on the lunar module. And at the present time, our data here in Mission Control shows the two spacecrafts to be about 75 miles apart.

END OF TAPE

CAPCOM Antares Houston, COM check over.

ANTARES Loud and clear Houston. How me?

CAPCOM Roger out.

CAPCOM Apollo 14 this is Houston. LM tpi, ground solution, DELTA vx plus 63 feet per second, y plus 1, z plus 67. I say again LM tpi, DELTA vx plus 63.0, y plus 1.0, z plus 67.0, Antares, over.

ANTARES Rog, copy, plus 63, plus 1 plus 67, thank you.

CAPCOM Roger, out.

CAPCOM 10 seconds to LOS. Go get them see you on the other side, Ed.

PAO We've had loss of contact now with Antares. We'll be loosing contact with Kitty Hawk in about 45 seconds. This is Apollo Control at 142 hours 59 minutes. We'll be reacquiring the lunar module, Antares in about 43 minutes 40 seconds. We'll pick up the command module a bit earlier, again because of the higher orbit that the command module is in, reacquiring Kitty Hawk in about 42 minutes. By the time that we acquire, the crew will have performed the transfer phase initiation burn. That will be about 85 feet per second, performed with the ascent propulsion system engine. It'll be a posigrade maneuver, and as we reacquire the spacecraft, that will be on the line of sight closing, preparing to do their breaking maneuvers, and shortly after reacquiring, they should begin station keeping. At the present time, our displays predict that the separation distance between the 2 spacecraft is about 51 nautical miles, closing at a rate of about 231 feet per second. At 143 hours this is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control at 143 hours 33 minutes and we're about 8 1/2 minutes now from reacquiring the LM and CSM as they come around on the front side of the moon. The Lunar Module should have performed the terminal phase initiation manuever on the backside of the moon. This manuever is - a fine computation for it is done onboard. The figures given from the ground are used as a check and a backup for the planned maneuver. It looked as if the burn would have probably come out to around to around 85 feet per second and would have been performed at about 143 hours 10 minutes ground elapsed time. When we reacquire, in about 7 minutes 45 seconds from now, Antares should be on its final approach into the CSM on aline aside approach, and nearing the breaking gaits, beginning to slow down. The final docking of course, as on previous missions, will be performed by the CSM, by Stu Roosa. That is primarily because of the visibility difficulties that the crew in the lunar module has when the 2 vehicles close at very close rates. And the plan is for Roosa to proceed with a normal docking. If, at the time that the probe is inserted into the drogue of the lunar module, we don't get an immediate capture, Roosa will deactivate his stabilization control system from the command module and the lunar module will thrust to hold the probe firmly into the drogue in the hope that if the capture latches on the probe are a bit slow engaging that they will occur at this time. We would expect that we would get a normal docking, based on the data that has been analyzed from the previous successful docking following translunar injection. If, however, we do not get a normal docking, we're prepared with several contingency procedures, which range from attempting to energize the neumatic system that retracts the drogue or the probe rather, and latching up with the primary docking latches. If this doesn't work, we would be prepared to instruct the crew in jumpering an electrical connection so that they would put electrical power onto the activate switch, a control for the probe assembly, hoping to retract it that way. And the - of course the final procedure would be to go extra vehicular or an extra vehicular transfer. We're now 5 minutes 30 seconds from reacquiring. We would like to mention, also at this time that Apollo 12 Commander Charles Conrad will meet with Newsmen in the main auditorium of the MSC News Center at 3:30 PM today to discuss Lunar Surface Operations on Apollo 14. That will be Astronaut Pete Conrad, in the MSC News Center main auditorium at 3:30 PM today.

CAPCOM Madrid your prime both vehicles, ascension, your backup, both vehicles.

MADRID Madrid copy.

ASCENSION Ascension copy.

CAPCOM Houston, out.

PAO This is Apollo Control at 43 hours 41 minutes and we're now less then 45 seconds from reacquiring the spacecraft as they come back on the frontside of the moon. Shortly after reacquiring, we expect Stu Roosa in Kitty Hawk to activate the television system there. We have the lines up and we are prepared to receive the television in Mission Control and see the final closing and docking operation.

CAPCOM Apollo 14, this is Houston. Over. Antares, this is Houston. How do you read? Over.

ANTARES We read you loud and clear Houston.

CAPCOM Roger, Antares. How'd it go?

ANTARES Just about as nominal as they could be. We had good TPI and midcourses of around 1.9 and 1.1 feet per second (garble) give you the exact numbers if you want them, but everything is about nominal.

CAPCOM We'd like the numbers for TPI.

KITTY HAWK Your locked up on the steerables, Houston.

CAPCOM Say again, Ed.

ANTARES Ed will give them to you.

KITTY HAWK Okay, the numbers for TPI, NOUN 81 plus 62.1 plus point 1 plus 63.1, burned on time and NOUN 6 is 00 plus .1

CAPCOM Roger. And say again about the steerable. Kitty Hawk, Houston. Are you reading us now?

KITTY HAWK I'm reading you loud and clear.

CAPCOM Roger, Stu. Could we have your TPI solution please.

KITTY HAWK Stand by 1.

PAO Stu Roosa has the television active in the command module. We got a brief picture here in the control center and then it dropped out again. We'll stand by for getting a good lockup on the television.

KITTY HAWK Houston, Kitty Hawk.

CAPCOM Go ahead, Kitty Haawk.

KITTY HAWK Okay on the VHF, I mean a sextant only solution, I had a minus 67.4 plus 0.5 minus 69.2. I didn't get the ranging to work. When our COMM got better after TPI everythings worked out good.

CAPCOM Understand, you did get the VHF ranging going after TPI?

KITTY HAWK That's affirmative.

CAPCOM Sounds good.

KITTY HAWK Well, Bruce. I was going to send you some TV. I had it on standby and I went to transmit and I could see the surface pretty good and all of a sudden it quit.

CAPCOM Stand by on that, Stu, We can probably get it to work again.

KITTY HAWK How do you configure down there?

CAPCOM Stu, this is Houston. I think that's a ground commanded configuration problem. And as soon as we're through dumping the backside tape, we'll give it back to you.

KITTY HAWK Okay. What are you doing way down there oh fearless one?

PAO Roosa's comment that the LM was way down there is a pretty good indication that they have not begun station keeping at this time and are still on the final approach.

KITTY HAWK Should be at 1.52 or something like that.

CAPCOM Kitty Hawk, Houston. We'd like you to load the nominal LM weight and the DAP please, 5700.

KITTY HAWK Okay. I got a spot -

PAO We'd expect the line of sight, breaking manuevers performed by the lunar module, to continue for about another 5 minutes before they're in the position to begin the station keeping. And we will be standing by for completion of the data dump, dumping the data tapes, at which time we'll be able to bring up the television.

KITTY HAWK The line of sight through the COAS looks real good.

PAO And we're beginning to get some indications of a television picture now.

END OF TAPE

CAPCOM Okay Stu, we're getting a great TV signal now.

KITTY HAWK Okay. I'll try a little zoom. I don't know if you can pick him up yet or not.

CAPCOM Okay, Kitty, tell us roughly where he is in the monitor, and give coordinates.

KITTY HAWK He's right on the top of B and C, on the line in between them it looks like Bruce.

CAPCOM Roger. Is that B2 and 3.

KITTY HAWK Well, let me see. I can't see that far over to the monitor. Let me take another look.

CAPCOM Oh, don't worry about it.

KITTY HAWK I'll look out the window here first.

CAPCOM Okay, we've got it now. Roger, Stu, we've got him at the lefthand edge of our picture about 1/3 of the way down from the top, growing bigger every second.

KITTY HAWK Okay. Roger. Looking mighty pretty. No sweat. Okay, I think I'll just have a few pictures of you here. You've lost a little weight since the last time I saw you.

PAO The range at this point is less then 1/10 of a mile. The vehicles are closing at about 4 feet per second. The poor quality of the television picture is due to a weak signal strength. The communications engineer is looking into it to see what can be done, perhaps on the ground to improve the signal strength.

KITTY HAWK Okay.

ANTARES Houston, Antares. The spaceship is about 100 feet, closing in a little more for the pictures of the Service Module and Command Module.

CAPCOM Roger, Al. We've got you on television, and it's looking beautiful.

KITTY HAWK Okay, any time you're ready Al, you -

ANTARES Okay, we've got you Stu, go ahead and turn around, we'll photograph you.

KITTY HAWK Let me turn the TV off here.

CAPCOM Hey Stu, looking at the ascent stage of the LM, it looks like there's something hanging loose from the bottom of it, a piece of wire or insulation or something. Any comment on that?

KITTY HAWK Yes, I saw that. I was going to wait till we got in a little closer. Probably part of the separation plane, I'm sure.

CAPCOM Yes, we concur on that.

KITTY HAWK Let me turn the TV out there before I blast it into the sun on this picture now, Bruce.

CAPCOM Roger.

CAPCOM And Stu, we'd like to confirm that you got the LM weight of 5700 pounds loaded in the dap prior to the docking.

KITTY HAWK Okay.

ANTARES Okay, I see a smooth loop there.

KITTY HAWK That's no problem, Bruce. Cause I dock and I'll go free and then I'll get all mine squared away, but I'll load it in.

CAPCOM Roger. Out.

ANTARES Okay. Stand by 1 here.

ANTARES Okay, I shall do a loop leader.

KITTY HAWK Okay, make it smooth. And around we go.

ANTARES Show us a little style. Oh, you look good.

KITTY HAWK There I was at 240 000 coming over the top.

ANTARES That's our home away from home.

CAPCOM Would you believe 360 000?

KITTY HAWK Yes.

ANTARES Okay, Houston. Kitty Hawk is doing an extremely smooth loop. We're sitting at 70 feet watching him go around. He looks very clean. He looks very clean (garble)

PAO We would expect to get a television picture back once Stu Roosa has completed manuevering in the command module in the proper attitude for docking.

ANTARES Oh, you look clean, nice and clean, Stu. Want to come in a little closer. It'll save you some gas?

CAPCOM Ed, this is Houston. When you get a chance on panel 16, would you check the ASA and AEA circuit breakers. We've lost data from the AEA only. Over.

ANTARES There both in.

CAPCOM Thank you.

KITTY HAWK That close enough?

ANTARES Yes, that ought to do it.

KITTY HAWK Houston, what that is trailing is a little bit of that foil on the bottom part of that tank area there.

CAPCOM Thank you Stu.

KITTY HAWK Looks like during separation, the foil - that insulation got ripped, the other side is down tight, and the side you're looking at there is ripped out pretty badly.

CAPCOM Roger. Thank you Stu, and we got a real good TV picture.

KITTY HAWK Okay.

CAPCOM Antares, this is Houston. Request low bit rate As OMNI. Over.

ANTARES You want low bit rate as OMNI? I think we can come in much closer then that Al. Aren't you going to do your ROLL? Okay. Yes. Okay, I'm starting my roll.

ANTARES Houston, Antares. How do you read? Houston, this is Antares. How do you read?

ANTARES Okay, why don't you just stop it there. I need to translate data anyway.

CAPCOM And Kitty Hawk we show you a P47 for the docking. Go ahead Antares.

CAPCOM Roger, Ed. We copy.
KITTY HAWK Okay, Houston. I have a -
CAPCOM Kitty Hawk, Houston. Your GO for (garble)

END OF TAPE

CAPCOM Antares, this is Houston.
CAPCOM Antares, this is Houston. We'd like to get the steerable off. Pitch 170 yaw plus 55 5 separate and record that you and Kitty Hawk can not make contact until we establish good telemetry. Over.
ANTARES Roger, Ed. Steerable OFF. Say again (GARBLE)
CAPCOM Okay. Pitch for 170, yaw 55 Ed. Over.
ANTARES Say again.
ANTARES You think we're locked up. How do you read?
CAPCOM Roger. Loud and clear, Ed and we have high bit rate.
ANTARES Okay.
CAPCOM Apollo 14, this is Houston. You're go for the docking.
ANTARES Roger. We got you.
ANTARES Yeah. How about that.
ANTARES Say again.
ANTARES Okay, we capture.
CAPCOM Beautiful. Normal docking.
ANTARES Okay. And we have a hard dock.
CAPCOM Beautiful. There's a big sigh of relief being breathed here around here.
KITTY HAWK All over the world there is.
ANTARES You want to try it from up here.
CAPCOM This world and out of this world too.
ANTARES Let me clean up over here and I'll be -
CAPCOM Antares, Houston. When you have a moment go to POO and DATA for us and we've got an uplink for you.
CAPCOM Good.
ANTARES Okay. You have us, Houston.
CAPCOM Thank you.
ANTARES Houston, are you going to give me the LM - command module weight?
CAPCOM Ed, this is Houston. Understand you want the command module weight now?
ANTARES Whatever you have I'm ready to copy.
CAPCOM Okay. CSM is 34727 and the LM is 5103. Over.
ANTARES Just a minute - 5103 34727.
CAPCOM That's correct, Ed.
CAPCOM And Kitty Hawk, Houston when you get through with what you're doing there, Stu, I do have a SEP pad for you.

KITTY HAWK Okay. 34727, thank you.
CAPCOM LM 5103.
KITTY HAWK Okay, and 05103.
CAPCOM Roger, up.
CAPCOM Antares, Houston. I have a LM impact P-30 pad for you when you're free.
ANTARES Roger. Give me five seconds.
KITTY HAWK Well, I guess I better get to crackin troops, I've got put - your 160 pounds of rocks some place.
ANTARES Yep. Soon as we get the tunnel open.
KITTY HAWK Rog. I'll be working on that in just a second here I'll start equalizing.
KITTY HAWK Okay Antares, I'm going to be off the air for about 3 minutes here.
ANTARES Okay Stu.
ANTARES Hey Bruce, go on your P-30 pad.
CAPCOM Say again, Ed.
ANTARES I'm ready to copy P-30 pad.
CAPCOM Okay. P-30 purpose good by LM. TIG 147541890. NOUN 81 minus 01820 plus 00390 plus all balls. HA and HP are NA. DELTA V are 01861 115012176 minus 01819 plus 00390 minus 00060. Read back. Over.
ANTARES (garble) Impact P-30 pad. 147541890 minus 01820 plus 00390 plus all zeros. HA PNA 01861 115012176 minus 01819 plus 00390 minus 00060 in the pad.
CAPCOM Roger. And you've already got the LM weight.
ANTARES That's affirmed.
CAPCOM Okay Ed. If you would, we'd like a few words from you on the subject of the AGS. We've lost the AGS downlink telemetry and sort of at a loss as to what it's current status is. Could you spare a little time for that?
ANTARES Rog. It performed beautifully up until the time you asked me to check circuit breakers. I looked at the circuit breakers are okay. I tried to look at it from a backup breaking gate about that time, found I could not access it. Furthermore, the ball, the AGS ball is still at 150 degrees pitch, zero yaw zero roll at - had it been for some time. And I had no warnings. All the circuit breakers were in but I cannot access it to give a cell test.
CAPCOM When was the last time you tried to access it Ed?
CAPCOM Successfully?
ANTARES Well, just now at - oh - about - oh shortly before we hit the breaking gate.
CAPCOM Roger.

CAPCOM Ed, this is Houston. We would like you to - on panel 16, cycle the ASA and AE circuit breaker - AEA circuit breaker if you would please?

ANTARES Okay. They're cycled.

ANTARES Further Ed to that last question Bruce. It was somewhere around AOS but I don't remember exactly where.

CAPCOM Rog, Ed. That's close enough.

ANTARES Good enough.

ANTARES I abandoned the AGS. Started setting up the cameras for the docking about that point.

CAPCOM Okay, Ed. And if you didn't see any change we'd like you to take the AGS operate switch - the AGS static switch and cycle it from operate stand by and back to operate and if that doesn't do any good on panel 11, we'd like to close the Commander's AEA circuit breaker. Over.

ANTARES Okay. That hasn't been any good. We'll try the other one.

KITTY HAWK Okay. I'm back now.

ANTARES Hey, that doesn't seem to help either, Bruce.

CAPCOM Okay. Which one was that?

ANTARES Any of them. I put in the Commander's circuit breaker, its still has not gotten anywhere with it.

CAPCOM Okay. Lets skip the AGS and leave it in its present situation and I've got a few items I'd like to read off for return over and above the nominal return items.

CAPCOM Ed, this is Houston. I'd like to read you up some extra return items if you've got a piece of paper around.

END OF TAPE

SC Okay, I'm ready to copy.

CAPCOM Okay, item number 1, the 100 foot tether, over.

SC Okay, we've got that one.

CAPCOM Number 2, the LEC waste tether combination, over.

SC Okay.

CAPCOM Number 3, 30 foot tie down webbing, over.

SC Okay.

CAPCOM Item number 4.

SC Okay, now I'm cracking the hatch now.

CAPCOM We would like to bring back the commanders hassleblad and recommend that that go in the ISA, if you want to bring back the LMP hassleblad also that could go in B1, but we need the commanders hassleblad, over.

SC We thought about bringing them both back, but since you said not to we left one on the surface, but you'll have the CDR's.

CAPCOM Roger, we copy. Item number 5, we want both of the LMP's EVA gloves, over.

SC Okay, they're aboard.

CAPCOM And of course we're going to bring back the docking probe. Now on stowage, the first 3 items, the tethers and the webbing can go in the temporary stowage bags in the command module. The Hassleblad and the ISA which is normal, and your gloves can go in the PGA bag curl up underneath the right hand couch in the temporary stowage location.

SC Okay, we've already stowed most of this stuff Bruce, the tether, the 100 foot teather is already in the ISA, the LEC (garble) and so can the 30 foot tie down webbing. The commanders Hassleblad we can put in the ISA, the EVA gloves are already in the ISA.

CAPCOM Okay, stand by. Ed, this is Houston, over.

SC Go ahead.

CAPCOM We'd like to get the tether, especially the 100 foot tether out of the ISA because you're going to be bagging the ISA in a contamination bag and we plan on using the 100 foot tether, the LEC waste tether and the 30 feet of tie down for securing the docking probe for reentry, so if you can do it without impact, we'd like you to get that stuff out before you put the ISA in the contamination bag. All the other stowage is okay, over.

SC Okay, we'll see what we can do.

CAPCOM Roger.

CAPCOM Kitty Hawk, Houston, are you back on the line, over.

KITTY HAWK That's affirmative.

CAPCOM Okay, I don't want to interrupt but when ever you're free I've got your sep pad.

KITTY HAWK Okay, why don't I take it now. I'm waiting for a hatch check here.

CAPCOM Okay, let me know when you're ready.

KITTY HAWK Let her rip.

CAPCOM Okay, CSM sep, RCS, tig 146, 300000, noun 81 minus 00010, y and z are all zips. Roll, 301, 355, 348, the rest of the pad is NA, remarks LM jettison time, 146, 25, 00, and they're all pitch and yaw for LM jettison is the same as for sep, over.

KITTY HAWK Okay, sep pad 146 30 0000, wx minus 1.0 all zips, all zips, 301 355 34B, jettison 146 25 00 00 301 355 348.

CAPCOM Roger.

ANTARES Okay, Bruce, I'm ready to copy any pads you have for me.

CAPCOM Ed, this is Houston, I believe we're up to date already on you.

ANTARES Okay, I misunderstood. I thought you had a call for me a minute ago.

CAPCOM Kitty Hawk, Houston, we'd like to get POO and ACCEPT if that's convenient with you and confirm all the rotational hand control power direct switches off please.

KITTY HAWK Okay, you've got POO and ACCEPT and direct off.

CAPCOM Roger, out.

ANTARES Stu, are the pressures equal to tunnel yet?

KITTY HAWK That's affirmative, I'm about to drop the hatch, and Ed, could you verify, or Al, the forward dump valve to auto.

ANTARES That's verified, Stu.

KITTY HAWK Okay.

KITTY HAWK How dusty was it down there.

ANTARES We don't have a lot of dust in here, but our suits are sure filthy.

KITTY HAWK Okay.

CAPCOM Kitty Hawk, Houston, the computer is yours.

KITTY HAWK Okay.

CAPCOM Kitty Hawk, Houston, were you calling?

KITTY HAWK That's negative, Bruce.

CAPCOM Roger, out.

CAPCOM Apollo 14, this is Houston, 12 minutes to LOS.

ANTARES Okay, Bruce.

PAO This is Apollo Control at 144 hours 46 minutes. In about 7 and a half minutes we'll loose contact with the spacecraft as they go behind the moon on the 32nd revolution. For about the next hour or so all three crewmen will be busily involved in getting a number of items cleaned and

PAO ready for transport to the CSM where they'll be stowed. Such items as the cameras, rock boxes helment and gloves, and a number of items in the interim stowage assembly. They also be bringing back the clothes line tether arrangement used to haul items in and out of the LM on the lunar surface, and will also stow the probe assembly in the command module. This probe assembly normally would be stowed in the LM prior to LM jettison, but it will be brought back so that engineers here on the ground will get a chance to look at it and see what the problem was in those early docking attempts following translunar injection. The LM jettison is scheduled to occur at about 146 hours 24 minutes, about 4 minutes later the CSM will perform a small separation maneuver, and at 147 hours 53 minutes the lunar module deorbit burn will be performed. This burn will be initiated by remote control from a command sent from the guidance oficers console here in the control center. Prior to leaving the LM Shepard and Mitchell will verify that it's set up in the proper configuration to maintain the desired attitudes so that we can communicate with it to get those commands into its guidance system, and they'll also punch in the targeted burn information, which will be prepared by the Flight Dynamics Officer and read up to them. We're now about 5 minutes, 45 seconds from loss of signal and Flight Director Milton Windler is reviewing status of both spacecraft with his flight controllers before we loose contact. Astronaut Pete Conrad, Apollo 12 commander will meet with newsmen in the large auditorium in the MSC news center at 3:30 PM today to discuss lunar surface operations on Apollo 14. At 144 hours 50 minutes this is Apollo Control, Houston.

END OF TAPE

CAPCOM Apollo 14, this is Houston.

SC Go ahead, Houston.

CAPCOM Apollo 14, Houston with 3 minutes and 45 seconds to LOS. Both vehicles are GO on all systems. We'll see you on the other side. Over.

SC Okay.

PAO This is Apollo Control. We've had loss of signal now from both vehicles and we'll be reacquiring at 145 hours 40 minutes and at that time the spacecraft, Kitty Hawk will be on its 33rd revolution of the moon. At 144 hours 55 minutes, this is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control. Astronaut Charles A. Conrad is scheduled to meet with newsmen at this time in the main auditorium at the Manned Spacecraft Center News Center. We'll take down the release line at this time and record any conversations with the spacecraft when we reacquire in about 38 minutes if that's necessary. At 145 hours, 3 minutes this is Apollo Control.

END OF TAPE

PAO This is Apollo Control with 145 hours 41 minutes. We're standing by now for acquisition of the LM and CSM. On this revolution, the two vehicles docked. The crew aboard Antares, Al Shepard and Ed Mitchell will be verifying the jettison attitude, the same as the LM is configured to maintain the proper attitude after jettison so that controllers here on the ground can input the proper information to the LM guidance system to initiate the maneuver with - the lunar module that will cause it to impact the lunar surface. They're also scheduled to get out of their suits and transfer into the CSM. We'll stand by now for any conversation with the spacecraft as soon as we get good communications - at the moment are quite noisy as we wait for antennas to get in the proper attitudes so that we get a good solid lock on.

CAPCOM How do you read. Over.

CAPCOM Apollo 14. Apollo 14, this is Houston. Over.

CAPCOM Apollo 14. Apollo 14, this is Houston. Over.

CAPCOM Apollo 14, Apollo 14, this is Houston. Over.

CAPCOM Apollo 14, this is Houston. How do you read? Over.

PAO This is Apollo Control. We're continuing to get quite a bit of noise on the communications circuit.

CAPCOM ... I'm right here - but I can't understand what you're saying. Are you progressing in a (garble)

SC Houston, we're (garble) and if we have anything to say here, we think you'll pick it up and we're pressing along nicely.

CAPCOM Roger. For your information, although I don't want to make this a formal flight plan update at this time, after the TEI they'll be no lunar topo that is no Hycon camera photos. Do plan on taking a - Hasselblad shots and taking assessment of targets one and two but right after your DAP load at 150 hours plus 32 minutes, you can plan on initiating PTC and then initiating sleep. Over.

SC I don't believe that will be a hard one to fill.

CAPCOM I didn't figure you would fight us on it.

SC Houston, 14.

CAPCOM Apollo 14, this is Houston. Go ahead.

SC Okay Bruce. What did we ever do about this close out of the LM. Just ignore the AGS, huh and stay with the change and everything else the same?

CAPCOM Stand by, Ed.

END OF TAPE

CAPCOM Stand by, Ed.

CAPCOM Antares, Ed, this is Houston. On the configuration, you can just leave the AGS in their current configuration. No need to target it or fool around with it, and we'll be talking to you as you progress through the close-out. This does not constitute a GO for closeout. Over.

SC Roger, Roger. Understand.

CAPCOM Antares, this is Houston. Over.

ANTARES Go ahead, Houston.

CAPCOM Antares, this is Houston. We'd like you to go to the DAP loading procedure at the top of page 15 in your LM timeline book. We don't show the 12021 loaded in the DAP. Over.

ANTARES That's affirm, Houston. I haven't done that one. I deliberately held off on that one.

CAPCOM Roger. We're showing some RCS burns that maybe aren't necessary.

ANTARES Okay, loading it now.

SC Houston, 14.

CAPCOM Apollo 14, this is Houston. Go ahead.

SC Roger, Bruce. Ready for IVT the Command MOdule.

CAPCOM Okay, stand by, and I'll try and get you a GO.

SC Oh, Bruce. the thing we're short on is getting the COMM on the figure wanted. I don't - did you ever give me any steerable angles to start on?

CAPCOM Okay, Ed. You can go ahead -

END OF TAPE

CAPCOM Okay, Ed, you can go ahead and configure the comm at this time. The nominal values in the flight plan, pitch minus 40, yaw plus 49 are valid, over.

ANTARES Okay, I'll use those.

ANTARES Houston, your steerable is beeped up and on smooth.

CAPCOM Roger, Ed, the comm looks good to us and now we need Batts 5 and 6 on both normal and back up feed, over.

ANTARES Okay, (garble) here we go.

CAPCOM Antares, this is Houston. You're go for final close out, good bye, over.

ANTARES Okay, so long see you on the other side.

CAPCOM Roger, out.

SC Houston, this is 14.

CAPCOM 14, this is Houston, over.

SC Okay, I'm bringing on the logic switches.

CAPCOM Roger, stand by for PYRO ARM.

PAO Roosa now arming the pyrotechnics that'll be used in separating Antares from Kitty Hawk for the final time.

SC (garble)

CAPCOM Roger, Stu, stand by.

CAPCOM Apollo 14, this is Houston. You are go for PYRO ARM, over.

SC Okay, thank you.

END OF TAPE

KITTY HAWK Houston, 14. I still have go for jettison on time 146 plus 25?

CAPCOM Stand by, Stu.

CAPCOM Apollo 14, this is Houston. You are go for a LM jettison on time. The only thing we see is P47 when you get down to it in the time line just before jett. Over.

SC Okay. I got to get my PYROS on.

CAPCOM Say again about the PYROS on.

SC Oh, I was just saying I was only missing one thing. I said I got to get my PYROS on too.

CAPCOM Roger. We gave you a go for (garble)

SC (garble)

CAPCOM Roger. We don't mean to be backseat driving.

SC That's alright.

PAO That was Stu Roosa confirming plans to jettison the LM Antares at 146 hours, 25 minutes. We don't have a precise time for the crew transfer to the command module, however, Mitchell reported at 146 hours that they were ready for the transfer into the command module and at 146 hours, 4 minutes, we gave them a go to close out the LM. Following the jettison of the LM, which will give the two vehicles the separation rate of about a foot per second the CSM will perform a small 4 tenths of a foot per second separation maneuver to increase the separation distance.

END OF TAPE

SC Houston, 14.

CAPCOM Apollo 14, this is Houston. Go ahead.

SC Roger. Could you verify you could get into the computer. How do you verify it?

CAPCOM That's the computer in the LM? Over.

SC (garble)

CAPCOM Roger, we have verified it.

SC Roger.

PAO Over - standing by now for a LM separation in about 15 seconds.

SC It worked that time.

PAO And we confirm final SEP here on the ground.

SC And we break (garble) Antares.

CAPCOM Roger, 14.

PAO Our LM control officer reports that the LM came away nice and clean. It's holding altitudes well. The LM deorbit burn is scheduled to occur at 147 hours 54 minutes 19 seconds. That'll be a 75 second RCS burn imparting a total change in velocity of about 186 feet per second and leading to a lunar impact of the LM ascent stage at about 148 hours 23 minutes that we'll get an update on that after some initial tracking. The preliminary target point is latitude 3.5 degrees south and longitude 19.27 degrees west.

SC Okay Houston, we're through with the LM SEP BURN and whatever (garble)

CAPCOM Roger, we copy through with the SEP burn and maneuvering.

END OF TAPE

CAPCOM Apollo 14, this is Houston. We have approximately 10 minutes to LOS. After you arrive at your P52 attitude, we'll be ready to send you up a desired orientation uplink and have you noticed any dust floating around?

CAPCOM Apollo 14, Apollo 14, this is Houston.

SC Hello Houston, do you read 14.

CAPCOM Roger, 14.

CAPCOM 14, this is Houston, 6 minutes and 30 seconds to LOS. How do you read? Over.

SC You're completely unreadable, Houston. Every time you talk we drop the signal.

CAPCOM Roger. Stu, you're coming in pretty well, now. We'd like to have you acquire us on high gain. Over.

SC Houston, if you're asking for P00 and ACCEPT, you have it.

CAPCOM Thank you. We also need the high gain.

CAPCOM Apollo 14, Houston. How do you read?

SC Houston, everytime you transmit our signal strength goes down. Just right in synchronization with your words.

CAPCOM Roger. Out.

SC Houston, 14.

SC Houston, if your wanting P00 and ACCEPT, you have it.

SC Houston, how do you read 14?

CAPCOM Apollo 14, this is Houston. Uplink complete. It's your computer at 147 plus 10 plus 00. We'd like you to maneuver to ROLL 026, PITCH, 091, YAW, 000 for communications. High gain will be pitch minus 10, YAW plus 183. I repeat ROLL 026, PITCH 091, YAW 000, HIGH GAIN, PITCH minus 10, YAW plus 183 and the time for that is 147 plus 10. The normal time for the LTC photo pad maneuver, LOS. Over.

SC Roger. Verify the ROLL 026,

SC Verified.

PAO This is Apollo Control at 146 hours 53 minutes. As you've probably surmised from the amount of noise on the communications circuits during the latter part of that pass, we were having some problems getting a good lock with the spacecraft. Stu Roosa reported at 1 point that every time we would try to uplink voice communications trim, then it would fade out in signal strength almost simultaneously with that. We don't have an explanation at this time, but toward the end of the pass, just before LOS the signal strength apparently improved somewhat and the guidance officer was able to uplink some command into the lunar module and hopefully was able to get a new referent matrix, which is used in preparation for the transearth injection maneuver uplink to the CSM. On the next revolution, revolution 34, we'll be completing the uplink of commands into the lunar module to initiate the preparation for iniating the deorbit maneuver, which will cause the LM to impact on the lunar surface at about 148 hours 23 minutes. At the end of the 34 revolution, and at the beginning of REV 35, the transearth injection maneuver is scheduled. The Flight Dynamics

PAO Officer at the present time is computing the ignition time and burn duration and other information needed by the crew to perform that maneuver. And that will also be passed up at the beginning of the next revolution. We're now 59 minutes 18 seconds away from the ignition for the LM deorbit maneuver. And we'll be reacquiring the command module, Kitty Hawk in about 43 minutes. At 146 hours 55 minutes this is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control, 147 hours, 36 minutes, ground elapsed time. Some 1 minute, 40 seconds away from acquisition of Apollo 14. Coming around on the 34th lunar revolution for the Command Module. And counting down toward the LM RCS burn, which will cause the spacecraft deorbit and inpact the lunar surface. That countdown clock now showing slightly over 17 minutes. The lunar impact is now predicted to take place at 148 hours, 22 minutes, 19 seconds ground elapsed time. At latitude 3.527 south, by 19.152 west longitude the impact will be at approximately 5, 506 feet per second. The spacecraft weighing at that time about 5, 270 pounds. The flight path will be a minus 4 degrees to the local horizontal or the surface of the moon as it impacts, which should scratch quite a gouge across the surface at such a flat angle. At the time of the lunar module impact, Dr. David Dudley Strangway of the Manned Spacecraft Center Lunar and Earth Sciences Division will provide a commentary on the experiment for the real time data from the moon. This will be in the small briefing auditorium in the building one news center. Dr. John R. Freeman of Rice University also will be present to report on the detection of the LM ascent stage engine exhaust by the superthermol ion detector at the Apollo 12 ALSEP, which is somewhat to the west of the present location. Here comes 14 over the hill.

CAPCOM Roger, Stu.

SC Mark when they start.

CAPCOM Okay. I've got some pads here, the TDI 34 and 35 pads.

SC Well, we're mighty interested in the first one, anyway.

CAPCOM Okay. Let me know when you're ready to write.

SC I have pen in hand, awaiting your message.

CAPCOM Okay. TEI 34, SPS/G&N, 34720, minus 072 plus 008, 149, 16, 0430. Noun 81 plus 30133, plus 16674 minus 03403. Attitude 180000000. Noun 44, HANA, HP plus 00190, 34606, 228, 34366. Sextant star 11, 1249, 225. Noun 61 minus 2703, minus 17151, 11604, 36252. GET for 05g, 216, 23, 33. GDC aline stars are Sirius and Rigel, 140, 020, 350. All H4 jets 12 seconds. Go ahead.

SC Okay, Gordon. TEI 34 pads, SPS/G&N, 34720 minus 072 plus 008, 149, 16, 0430 plus 30133 plus 16674 minus 03403, 180000000. HA NA plus 00190, 34606, 228, 34366, 11, 1249, 225. Noun 61 minus 2703, minus 17151, 11604, 36252, 21623, 33. Sirius and Rigel 140, 020, 350, 4 jet 12 seconds.

CAPCOM Okay, Stu. Readback correct. I'm ready the TDI 35.

SC Go ahead

CAPCOM TDI 35, SPS/G&N, the weight is 34720 minus 072 plus 008, 151, 16, 0294, plus 30977 plus 16331 minus 04682, 178, 358, 359. Ullage 4 jets - correction 4 jets 12 seconds. Go ahead.

SC Okay. TDI 35, SPS/G&N, 34720 minus 072 plus 008, 151, 16, 0294 plus 30977 plus 16331 minus 04682, 179, 358, 359, 4 jets 12 seconds.

CAPCOM Okay, Stu. The readback is correct. I have some more imformation for this upcoming photographs with the 500 millimeter of the 13 S4B impact crater. Over.

SC Okay.

CAPCOM Okay. Give us POO and ACCEPT. We'll give you a state vector and target load while we're getting this.

SC Do you have it?

CAPCOM Okay. Information on the photo pass, at 148:15 maneuver to roll 026, pitch 104, yaw 000. We suggest you use magazine papa, the same 500 millimeter coas procedures as before. Key start is 148:23:03. For locating visually the target, we suggest you use the 0 phase land mark map 7 and 8. To refresh your memory the impact crater is on the northeastern rim of Landsberg B located on a line from Landsberg. So these procedures we want you to pitch at - -

END OF TAPE

CAPCOM procedure wants you to pitch at C star plus 1 minute and ignore the ORDEAL. Do not use the ORDEAL numbers this is because of a misalinement due to the TEI REFSMMAT. The pitch should work out to be a pure pilot pitch. Over.

SC Okay. At 148 15 maneuver to 026 104000 use magazine frame, the same 500 millimeter procedures. C star to 148 2303 northeast rev of Landsburg - I know the general area. I don't know how good an area this type of photography covers though.

CAPCOM I can - I think the field of view is probably noticed on your orbital maps there, if you want to look it up. I think I looked the one time the 500 millimeter should just about catch all of Landsburg B.

SC Yeah. I though - I sort of got the impression today Gordon that it might have been narrower than that but that's fine. I know the general area to photo.

SC I guess you want me to do that after one minute pitch to 328 and quit, huh?

CAPCOM The answer to that is affirmative. I have an up -

SC And as soon as we finish that we do the VERB 49. As soon as we finish that then we go right into VERB 49 maneuver to the fan burn attitude, right?

CAPCOM That's affirmative, Stu. I also have a map update for rev 35.

SC Go ahead.

CAPCOM Okay. It's your computer now. We're through with the uplink. And LOS time is 148 50 34. 180 time 149 15 29. AOS with TEI 149 26 49. AOS without TEI 149 36 45. Over.

SC Okay, I think the only one there - Give me the - I don't need the 180 but I got with TEI AOS will be 1492649 without. 1493645. Give me LOS again?

CAPCOM Okay. LOS 148 50 35. You copied the AOSs okay.

CAPCOM 14, Houston. For your information there's about 3 minutes - 2 minutes and 50 seconds to LM ignition.

SC Okay.

CAPCOM Stu, this is Houston.

SC Go ahead.

CAPCOM Stand by 1.

CAPCOM Okay Stu. We took a look at your geometry when you're in this attitude prior to starting the COAS maneuver. Turns out that your're probably going to be able to see through the optics Antares hit the ground. If you wish and you have the time, one of the LM crew there

CAPCOM could select P24 and we've got the numbers to set into NOUN 89 and we'll give you a impact time. You may be able to see it hit.

SC Okay. P24 NOUN 89. Ready to copy.

CAPCOM Okay. Right now we may have an update on this with - after they track it out to the burn but right now minus 03527 minus 09576 and a plus all balls. Over.

SC Yeah I copy minus 03527 minus 09579 plus all zips.

CAPCOM Okay. That second register, last digit is 6. Minus 09576.

SC Okay. Minus 09576 and what's the time of impact?

CAPCOM Okay. Impact time will be 148 22 19. This is about a minute and forty seconds prior to when you'll start pitching for the COAS maneuver. Over.

SC Okay.

CAPCOM If it's handy, and you want to try to photograph it through the sextant, we'd suggest using CEX at 24 frames per second 1/60th of a second shutter speed and start it at 30 seconds prior to impact and let it run through to 30 seconds after. Over.

SC Okay.

CAPCOM And the LM is burning now.

SC Okay.

SC Houston, 14.

CAPCOM Go ahead.

SC Okay. Those other procedures call for 250 and F:11. Is it going to be a little darker over at Landsburg North? Do we want to change those settings?

CAPCOM Stand by Stu.

CAPCOM 14, Houston. We'd like you to use F:11 1/250th focus infinity. Over.

SC Okay. F:11, 1/250th and infinity.

CAPCOM That's affirmative.

PAO This is Apollo Control about 17 minutes away from lunar module impact. Again a reminder to newsmen in the Houston News Center, Dr. David W. Strangway in the MSC Lunar and Earth Science Divison will be in the small briefing room in the news room, the news center accompanied by Dr. John R. Freeman of Rice University who will also be there to report on the detection of Apollo 14 lunar module ascent stage engine exhaust by the super thermal ion detector way over the Apollo 12 landing site. Apollo Control at 14806.

CAPCOM Apollo 14, Houston.

SC Go ahead, Houston.

CAPCOM Okay. That NOUN 89 and the time of impacts for Antares are good after looking at it after its

CAPCOM burn and if you're going to - are you going to be using the DAC on the sextant? If so, we'll call a start and stop time to you.

SC That's negative.

CAPCOM Okay.

CAPCOM And just one other thing we want to be sure that we see P30 and P40 before your AOS. There shouldn't be any problem with them before your LOS.

SC Okay. We'll sure try.

END OF TAPE

SC We'll just let you look at them early, Gordon.

CAPCOM Roger, we're looking. P40 looks good to us.

SC Okay.

CAPCOM Stu, this is Houston.

SC Go ahead.

CAPCOM We've got about 9 and a half minutes of LM impact and at the risk of insulting your intelligence, we just wanted to remind you to, that if you do reselect P30 between now and the turn be sure to reload the noun 81's.

SC Okay, we won't reselect P30.

CAPCOM Roger.

CAPCOM 14, Houston.

SC Go ahead.

CAPCOM We'd like to have the tape recorder switch forward prior to starting your coas maneuver.

SC Yea, we'll give you a forward high bit rate.

CAPCOM Okay. 4 minutes to impact, now. Impact in 3 minutes.

PAO This is Apollo Control, about 3 minutes away from lunar module impact, which now is less than 10 miles above the lunar surface. Present velocity 5,415 feet per second.

CAPCOM Stu, for your information, trunion should be about 41 degrees at impact, so it probably won't clear the limit till just before impact. Apollo 14, Houston. I get a change to the setting on the hasselblad, a last minute change, over.

SC Go ahead.

CAPCOM Okay, they want it at s8 and 1127 for the second, s8 and 1127, over.

PAO Antares now about 2 miles above the surface continuing to come in at 5,490 feet per second. Less than a minute to impact.

CAPCOM ... to impact.

PAO Loss of signal from the lunar module antares.

CAPCOM Stu, 1 minute to T start on the 500 millimeter.

SC T start now, I believe.

CAPCOM You're right, my mistake. 14 Houston, say again please.

SC We're unable to see the LM impact -

CAPCOM Roger, Al, unable.

CAPCOM 14, Houston, we'd like a frame count on the hasselblad, with this last batch here, over.

SC Okay, stand by. Okay we went from 131 to 169, Gordon.

CAPCOM Roger, 131 to 169 and for your information, both the ALSEP seismometers ringing like mad.

CAPCOM 14, Houston, give us omni delta please.

CAPCOM Apollo 14, Houston.

SC Go ahead.

CAPCOM 14, Houston. We have about 16 and a half minutes till LOS. We'd like to see your burn attitude and also get a look at C40 prior to losing you.

SC Okay, we can probably do that.

END OF TAPE

CAPCOM Apollo 14, Houston.

SC Go ahead, Houston.

CAPCOM Would you put the tape recorder switch to forward and then we'll take care of commanding it for the upcoming LOS.

SC You have it.

CAPCOM Roger.

CAPCOM 14, Houston. 9 minutes now until LOS. We'd like to see you at burn attitude if possible before you go LOS.

SC Okay.

END OF TAPE

CAPCOM 14, Houston. For your information, in about 5 seconds you'll be 30 minutes from ignition. I'll give you a mark. Ready, mark.

SC Okay, thank you.

CAPCOM 14, Houston, P40 looks okay to us.

SC Thank you.

CAPCOM 14, Houston. Two minutes to LOS.

SC Roger.

CAPCOM 14, Houston. One minute to LOS and we'll see you on your way home.

SC Roger, Gordon.

PAO This is Apollo Control. We have had Loss Of Signal as Apollo 14 went behind the moon on its final revolution of the moon. With its successful TEI burn, Trans Earth Injection, the spacecraft should come out on the eastern edge of the moon at 149:2649 ground elapsed time. At the present time in the Houston News Center, the maroon team of flight directors, Milton Windler, accompanied by ALSEP's Senior Engineer, Paul Nering, will hold a Change of Shift Press Conference. At this time the circuit will be taken down and come up again just prior to acquisition of signal as Apollo 14 comes around on its beginning of its transearth coast path. At 148 51 this is Apollo Control.

END OF TAPE

PAO This is Apollo Control, 149 hours, 23 minutes ground elapsed time. 2 minutes, 54 seconds until acquisition of signal assuming a nominal transearth injection burn which should have taken place at 149:16 ground elapsed time, approximately 8 minutes ago. At the time of the burn the command service module of Apollo 14 weighed 34, 720 pounds. The burn itself consumed more than 10, 000 pounds of SPS propellants which brought the gross weight down to 24, 646 pounds. That divides out to about 68 pounds per second of propellant going out through the 20, 000 pound thrust SPS engine. The latest impact figures from the Flight Dynamics Officer for the Lunar Module ascent stage Antares, 3.420 south latitude, line 19.667 west longitude. At a ground elapsed time of 148 hours, 22 minutes, 25.4 seconds as the Antares struck the surface the communications engineer here in Mission Control commented that the LM's high gain antenna was sending out high bit rate data right up to the last. Back to the propellant used in the transearth injection burn, after the 10,000 pounds is used in this burn, which is the second largest burn required of this engine, in a lunar mission, there's 1600 pounds of propellant left which is adequate for weather avoidance transearth mid-course corrections. We're still about 39 seconds away from acquisition. We'll bring up the line a few moments before we have confirmation of AOS. 7 seconds. Let's open the circuit and listen to the air to ground. We've had AOS.

CAPCOM Apollo 14, Houston. How do you read?

SC Okay.

CAPCOM Apollo 14, Houston.

SC Hello, Houston. Apollo 14.

CAPCOM Roger, Al. You're loud and clear.

SC Reading you loud and clear, Houston.

SC Okay, Gordo. We had a good burn. Good burn. We're on the way home. Burn time was 1 second long, 2 plus 29, residuals before trimming plus .6 plus .8, minus .1. Residuals after trimming plus .2, plus .8, minus .1. Delta-VC minus 21.1, 025. Oxygen 24. Unbalanced decrease 40. Very smooth burn.

CAPCOM Roger, Al. That's good news.

SC You bet. We're like tourist with the cameras right now.

CAPCOM Roger.

CAPCOM Go ahead. Roger, Al.

PAO This is Apollo Control. At the present time, the crew of Apollo 14 is making photographs of the lunar surface using 500 millimeter lens on the hand-held Hasselblad cameras. Apparently, the lunar topographic camera which was planned for some high resolution photography on the going away portion here from the moon - -

CAPCOM Houston. We have some flight plan changes for you. The first of them, though, is not effective until about an hour from now so any time anyone has some free time, I'll read them up.

SC Okay, Gordon. We'll catch them in a little bit, if you want. We're enjoying the view.

CAPCOM Roger, Stu.

PAO Apollo 14 velocity now 7462 feet per second, 482 nautical miles above the surface of the moon and continuing to increase as the trajectory loops out away from the moon in a slingshot effect.

PAO The high resolution photography with the highcon camera apparently has been scrubbed because of the malfunction of this camera. This was scheduled at 150 hours 30 minutes and would have yielded some of the highest resolution photography thus far of the lunar surface.

PAO This is Apollo Control. Gold Team flight dynamics officer, Bill Stovall, has passed on to the flight director an estimate of the present trajectory. The vacuum perigee at earth on the present path of this trans-earth injection burn would be 74 nautical miles.

SC Okay, Houston. 14 standing by for your flight plan update.

CAPCOM Okay, Al. Let's see. Open the page to 15030.

SC Okay.

CAPCOM We'd like you to do everything as shown on up to the VERB 48 there at 150:35. And then we've got another procedure to - for one last ditch try with the highcon. The theory behind this is that in a static attitude with the FMC turned on, even though the shutter is malfunctioning, they think they can get an image on the film and then compensate for any exposure - off nominal exposure to the film by development afterwards. The procedure is not too lengthy, but find some blank paper to write it on there.

SC Gordo, are you really serious about dragging up the highcon now. We're just getting ready to go to sleep here, as soon as finish these hand-held pictures.

CAPCOM Okay. If - -

SC Hey, Gordon a little - Hey, Gordon.

CAPCOM Go ahead.

SC A little clarification on that. See, We hadn't planned on it. We've got it all stowed and everything all over it, since we hadn't planned on using. It's pretty tough to get to now.

CAPCOM Okay. I was instructred to mention it to you. If you had any feelings about it, well just forget the whole things and that's what we'll do. Just scrub

CAPCOM it. So after you change the DAP load there, we'd like you to do the procedures as shown an hour later there at 151:30 go into PTC and pre-sleep and you're clear to hit the sack after that.

SC Okay. 151:30 PTC pre-sleep and rest period.

CAPCOM Right. I don't mean to say you have to wait till 151:30 to do it. The procedures as shown at that time. You can do those as soon as you're ready.

SC Oh, okay. Thanks we'll probably do them a little sooner than that then.

CAPCOM If you'll give us POO and ACCEPT, we'll give you a PTC REFSMMAT.

END OF TAPE

SC Okay, you got it Gordon, POO and ACCEPT.
CAPCOM Okay.
CAPCOM 14, Houston. At your convenience, we'd like the NOUN 93 figures on that last P52 prior to TEI.
SC Stand by, 1.
CAPCOM 14, Houston. Uplinks complete. It's your computer.
SC Okay, we got it. Okay, Houston on the last 52, NOUN 71 2431 and on 5 all zeros. Again 93 plus 018 minus 091 plus 050. GET torque 1465825.
CAPCOM Okay, Al, we copy that.
PAO This is Apollo Control at 149 hours 59 minutes ground elapsed time. Apollo 14 homeward bound, now 9801 nautical miles out from the moon. Velocity coming toward earth is 6022 feet per second. Still up live on air-to-ground until the crew goes to sleep for the night. This is Apollo Control.
CAPCOM Apollo 14, Houston.
SC Go ahead, Houston.
CAPCOM We notice that you are manuevering to the attitude listed after that P52 option 1, which might not work for P52.
SC Okay, thank you.
CAPCOM Apollo 14, Houston. Apollo 14, Houston. Apollo 14, Houston. Apollo 14, Houston. 14, Houston. If you read, you might the cage B mags, go to rate 2. 14, Houston. If anybody reads you're dragging your B mags.

END OF TAPE

CAPCOM Apollo 14, Houston.
CAPCOM Apollo 14, Houston.
CAPCOM Apollo 14, Houston.
SC Hello, Houston, 14.
CAPCOM Roger, you're still there, huh?
SC Well, we don't know if you been trying to call or not, but we've been hustling around on this storage, here.
CAPCOM Rog.
SC And, do our rates look good enough for spinup?
CAPCOM Stand by one, Stu. Stu, if you'll give us POO and accept, we'll get a state vector before we spinup, here.
SC That sounds good.
CAPCOM Also, I guess we're going to have one for you to write down by hand.
SC Okay.
CAPCOM I don't have it yet. For you information we got a - we got a monster mid-course 5 coming up and TEI plus 17 of 1 foot per second.
SC Hey, that's good. TEI plus 17, huh?
CAPCOM Rog.
SC You all sure do good work.
CAPCOM So do you guys. We thought you'd all gone to sleep on us up there.
SC Yeah, we were working on that, but we didn't have any place to sleep, we're unindated, so we've been scurring around trying to get things in some sort of order.
CAPCOM Roger. Well, we want to power down your tired bodies, here, as soon as you can arrange it. We have nothing at all programmed for about the next 12 hours. You guys have been doing an outstanding job, here, in the last couple of days and we appreciate it.
SC Okay, Deke, I'll pass that on. I'm the only one on the loop right now.
CAPCOM Right. Stu, it's your computer. I'll have that pad in a minute or two.
SC Okay, thank you.
CAPCOM Stu, on the sleep, we won't wake you until - til an hour or so after the scheduled wakeup time unless you're up sooner, over.
SC Alright, thank you.
CAPCOM And I got the state vector for you.
SC Okay, standby one. Okay, Gordon, ready to copy.
CAPCOM Okay, it is a state vector 71. GET of 151:15:00, index 21, and address 2 is 01501 00002 03742 line five there is 11325 76267 44423, line 10, 77055 42764 13266 10307 70560, line 15 is 54223 73757 44252 06426, line

CAPCOM 21 32440. Over.

SC Okay, reading state vector verb 71 151:15:00, index 21 01501 00002 03742 11325 76267 44423 77055 42764 13266 10307 70560 54223 73757 44252 06426 32440.

CAPCOM Roger, your readback's correct. Stu, this is Houston, computer is yours. The yaw jets just about to fire, so we'll wait a little bit, here, on the PTC spinup. Just want to be sure you have all your - your indumps complete before - before you do it.

SC Okay. Say, why don't you hold off on that for a little bit and we'll - we're not quite ready to spin it up.

CAPCOM Okay.

CAPCOM Hey, Stu, this is Houston, is your clean happy home still clean? We haven't heard much comment about any micro lunar samples floating around.

SC Yeah, it's amazingly clean, Deke. Almost no dust at all. The suits were a little dirty, but vacuumed off and we got almost zero in the command module.

CAPCOM Outstanding.

PAO This is Apollo Control. Stu Roosa only one with a headset on aboard the spacecraft, is presently setting up the spacecraft in the barbeque roll or passive thermal control as it's called in preparation for going to sleep for the night. Present altitude above the Moon 6746 nautical miles, velocity 4806 feet per second. We're going to leave the line up until the crew does sign off for the evening. At 151 hours 39 minutes standing by this is Apollo Control.

END OF TAPE

CAPCOM Apollo 14, Houston.

SC Go ahead, Houston.

CAPCOM You guys aren't worried about stowing the probe at the present time are you?

SC No. No Dick, we're just getting a little chow and getting squared away - sort of relaxing and looking at the folder (garbled) so forth. No, we're in good shape.

CAPCOM Okay. Fine. Well, we got a nice exotic procedure to read up to you some time in the next couple of days on final stowage on that thing. And, we didn't want you worrying about it.

SC No, we're ... we put it in a resting place up in the tunnel. We figured that'd be pretty good, till we got back.

CAPCOM Okay.

SC And ready to reenter.

CAPCOM Roger.

PAO This is Apollo Control. 152 hours 12 minutes ground elapsed time. Apollo 14 now showing a height above the Moon of 8149 nautical miles, velocity 4673 feet per second. The crew presently is eating, and after they're through with their meal they will call the Mission Control Center here for the last minute preparations before the sleep period, which may be extended to about 163 hours elapsed time. They will establish the PTC, passive thermal control or barbeque roll for the night. And, until they sack out we'll leave the line up at 152 12. This is Apollo Control.

SC Houston, 14.

CAPCOM 14, Houston. Go ahead, Stu.

SC Okay, Gordon, we're ready to spin up anytime the rates look good to you, and I have some onboard readouts.

CAPCOM Okay. Well, they're taking a check on it. They want to look at it a minute or two. Go ahead with the readouts.

SC Okay. Yea, they may have some reads, I just maybe want to wait a little bit but - Okay. Pad B 3740 pyro A 37.2 pyro B 37.2 RCS 60586060.

CAPCOM Okay. We got all that.

CAPCOM And, we'd like to remind you to be sure when we get to PTC go on to start. To go to the ... get the comm configured as shown in the checklist.

SC We'll do that, and as for crew status we're all okay. No medication. And, you ready for E mod dump?

CAPCOM Not yet, we're getting configured.

SC Okay.

CAPCOM We're ready for Verb 74.
SC Okay. Coming up.
SC Houston, 14.
CAPCOM Go ahead.
SC Okay, Gordon. Just to make sure we're all together, you want to use the OMNI mode for com?
CAPCOM Affirmative.
SC Okay.
CAPCOM Stu, would you be sure that that waste management overboard drain is closed tight. We want to be sure that this one takes so that we don't have to interrupt your sleep. And, if it is, then you're go for spin off.
SC Okay.
PAO This is Apollo Control 152 hours 41 minutes ground elapsed time. Apollo 14 now 9477 miles out from the Moon, traveling at a velocity of 4587 feet per second. Crew of Apollo 14 apparently have gone to bed for the night, put out the cat, and the alarm clock set for 10 hours 17 minutes from now. We'll take down the air to ground circuit at this time, record any future conversation during the night on tape for delay playback. And, at 152 hours 42 minutes ground elapsed time this is Apollo Control.

END OF TAPE

PAO ...53 hours 12 minutes ground elapsed time. The crew of Apollo 14 apparently is asleep at this time. Spacecraft now 10 824 nautical miles out from the moon on the return leg home. Velocity now 4 519 feet per second. Nine hours 47 minutes remaining in the sleep period. Rather quiet here in the Control Center; some of the flight controllers here on the gold team who were asleep during this morning's second EVA are planning to view a playback of the lunar television, here on the large color hydafor background television projector in the control room. And at 153 hours 13 minutes ground elapsed time, this is Apollo Control.

END OF TAPE

APOLLO 14 MISSION COMMENTARY, 2/6/71, 0:34 CST, 154:12 GET, 491/1

PAO This is Apollo Control 154 hours 12 minutes ground elapsed time. The crew of Apollo 14 still asleep at this time. The spacecraft revolving slowly about the longitudinal axis. Control mode longitudinal, stabilize the current response of the spacecraft in all consistency. 8 hours 47 minutes remaining in the sleep period. The distance now 13 457 from the moon. Velocity 4421 feet per second. The spacecraft weight 24 627 pounds. And at this time in the night, that's about all that can be said. At 154 hours 12 minutes ground elapsed time, this is Apollo Control.

END OF TAPE

APOLLO 14 MISSION COMMENTARY, 2/7/71, 01:34 CST, 155:12 GET, 492/1

PAO This is Apollo Control, Houston, at 155 hours 12 minutes ground elapsed time. Apollo 14 is presently 16 000 nautical miles out from the moon, and traveling at a velocity of 4354 feet per second. The crew continues in it's - in their sleep period. Our clock in Mission Control shows 7 hours 47 minutes until time of wakeup. We've had a shift change in Mission Control. The Black Team of flight controllers now aboard, very little activity, very little conversation on the flight directors loop over this past hour. We forecast much of the same for the next hour but we will stand by and continue to monitor. At 155 hours 13 minutes ground elapsed time, this is Apollo Control, Houston.

END OF TAPE

APOLLO 14 MISSION COMMENTARY, 2/6/71, 1:35 CST, 156:12 GET, 493/1

PAO This is Apollo Control, Houston at 156 hours 12 minutes ground elapsed time. The crew of Apollo 14 continuing in their sleep period. Our clock in Mission Control shows 6 hours 48 minutes until scheduled time of wakeup. Meanwhile, literally no conversation within the control center, certainly a period of more relaxed atmosphere for the Orange flight control team compared to the last two days. This is the team that worked during the two lunar excursions or walks on the moon by crewmenbers Shepard - Al Shepard and Ed Mitchell. We're at 156 hours 13 minutes continuing to monitor and this is Apollo Control, Houston.

PAO Apollo Control, Houston, 156 hours, 14 minutes ground elapsed time and at this time we show the Apollo 14 spacecraft at a distance of 18 651 nautical miles away from the moon travelling at velocity of 4303 feet per second. This is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control in Houston at 157 hours and 12 minutes ground elapsed time. Our display presently shows Apollo 14 at a distance of 21 093 nautical miles on it's return trip from the moon and traveling at a speed of 4 268 feet per second relative to the moon. We've had no change in status since our last report. All parameters remain normal. The crew of Apollo 14, Al Shepard, Stu Roosa, Ed Mitchell, still sleeping. Our clock in Mission Control shows 5 hours 47 minutes remaining until their wake up call is to be placed. So at 157 hours 13 minutes ground elapsed time, this is Apollo Control Houston.

END OF TAPE

PAO This is Apollo Control Houston at 158 hours 15 minutes ground elapsed time. Apollo 14 returning now to earth. We read on our displays a distance of 23 719 nautical miles away from the moon and traveling at a velocity of 4 238 feet per second. The spacecraft weight presently 24 627 pounds, considerably lighter than the weight that we saw at lift off or even prior to TEI, at which time Antares no longer belonged to the stack. Although you haven't heard him, our CAPCOM is Ron Evans. Ron the backup command module pilot for Apollo 14 will probably make the wake up call, some 4 hours and 44 minutes from this time. We're at 158 hours 16 minutes ground elapsed time and this is Apollo Control Houston.

END OF TAPE

PAO This is Apollo Control Houston at 159 hours 12 minutes ground elapsed time. Our display presently shows Apollo 14 at a distance from the moon of 26 123.6 nautical miles and traveling at a velocity of 4 219 feet per second. The sleep period for the crew of Apollo 14 continues. We presently show 3 hours 47 minutes until time of wake up. Literally no conversation over the loops in Mission Control. Flight controllers are on a standby situation, of course monitoring their various displays, reading out parameters. Meanwhile we do have some times, velocities, and distances for various milestone events en route to the earth from the moon and we'll pass those along now. Sphere crossing time, this being the time that Apollo 14 will cross out of the lunar's sphere of influence and into the earth's sphere of influence. The ground elapsed time reading for this event 162 hours 19 minutes 8 seconds. At that time, Apollo 14 will be at a distance of 184 793 nautical miles away from the earth and at a distance of 33 821 nautical miles away from the moon. Fourteen's velocity relative to earth will be 3 462 feet per second; fourteen's velocity relative to the moon at that time will be 4 173 feet per second. The next event will be that point in time when the 2 velocity references will match, the velocity relative to the earth the velocity relative to the moon. The time of this event ground elapsed time of 182 hours 3 minutes. At that time Apollo 14 will be at a distance of 140 446 nautical miles away from the earth and a distance of 82 765 nautical miles out from the moon. The velocity matching speed will read 4 370 feet per second. The midpoint in terms of time, reference here from time of the TEI burn cut off to entry, will be at a ground elapsed time of 183 hours 10 minutes. Fourteen will be at a distance of 137 581 nautical miles away from earth and at 85 625 nautical miles out from the moon. The midpoint in time velocity relative to the earth will read 4 440 feet per second; velocity relative to the moon 4 355 feet per second. The midpoint in terms of distance will occur at a ground elapsed time of 192 hours 39 minutes 45 seconds and at that point, the equal distance reading will be 110 931 nautical miles and fourteen will be traveling at a velocity of 5 216 feet per second relative to the earth and 4 764 feet per second relative to the moon. We're at 159 hours 18 minutes ground elapsed time and this is Apollo Control Houston.

END OF TAPE

APOLLO 14 MISSION COMMENTARY, 2/7/71, 6:42 CST, 160:18 GET, 497/1

PAO This is Apollo Control, Houston at 160 hours 18 minutes ground elapsed time. Our displays in Mission Control show Apollo 14 at a distance of 28 859 nautical miles away from the moon and travelling at a velocity of 4197 feet per second. We presently show 2 hours 41 minutes until that time of crew wakeup. However, we are presently monitoring medical data on Command Module Pliot Stu Roosa which indicates to the surgeon that Roosa is presently awake. However, relaxing in the cabin of his spacecraft. We're at 160 hours 20 minutes ground elapsed time and this is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control Houston at 161 hours 12 minutes ground elapsed time. We presently show Apollo 14 at a distance of 31 065 nautical miles away from the moon, traveling at a velocity of 4185 feet per second. Our mission control clock shows 1 hour and 47 minutes remaining until time of crew wake up. Stu Roosa apparently dosing off again, our medical monitoring indicates. Very quiet in mission control. Literaly no conversation over the loops, and at this point all parameters appear outstandingly normal. We're at 161 hours 13 minutes and this is Apollo Control Houston.

END OF TAPE

PAO This is Apollo Control, Houston at 162 hours, 12 minutes ground elapsed time. Our displays in Mission Control presently show Apollo 14 at a distance of 33,532 nautical miles away from the moon, and traveling at a velocity relative to the moon - 4174 feet per second. Over the past hour in a discussion with orange team flight director, Pete Frank, our retrofire officer Charles Dedrick described the transearth injection burn as very good. Perhaps the best ever. The flight path angle now reading minus 6.81 degrees, well within the corridor, retro reporting. Accordingly, it has been definitely decided Apollo 14 will not perform Midcourse Correction number 5. The current ground elapsed time for entry into the Earth's atmosphere now reads 216 hours, 27 minutes, 32 seconds. Also in this report retro noted that the ground track has shifted west by 68 nautical miles. The present aiming point coordinates read 172 degrees, 38 minutes west. 27 degrees, 2 minutes south. If this aim point continues to hold Apollo 14's splashdown point would be 8 miles across the international Dateline. At the aim point coordinates the international Dateline runs down 172 degrees, 30 minutes west longitude. Although Al Shepard, Ed Mitchell, and Stu Roosa went to sleep believing Tuesday was their landing day, Apollo 14 could very well splashdown 8 miles into Wednesday. Or if Shepard's landing on the moon in Antares is an indicator, who knows Apollo 14 may come down within 87 feet or less of the international Dateline. We're at 162 hours, 15 minutes ground elapsed time and this is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control at 163 hours 5 minutes. In Mission Control at this time our Flight Director Milton Windler and the Maroon Team of Flight Controllers are in the process of taking over from Pete Frank and the Orange Team. And we're about four minutes 50 seconds away from the scheduled crew awakening time. At the present time, Apollo 14 is traveling at a velocity of 4166 feet per second, and 35 709 nautical miles from the moon. We'll stand by for the crew awakening, now in about five minutes.

CAPCOM Apollo 14, this is Houston. Reville, reville, ease out and trace up.

SC Good morning, Bruce, how are you this morning.

CAPCOM Sweepers, man your brooms, clean sweepdown fore and aft.

SC The other sweepers are still asleep around here.

CAPCOM Okay Ed. How are you all this morning?

MITCHELL Really great Bruce, really great, how are things there?

CAPCOM Beautiful, everybody's relaxed down here and anticipating your arrival on schedule.

MITCHELL Very good.

SC Good morning, Bruce.

CAPCOM Who's that? Stu?

MITCHELL Yeah, it's Roosa over there.

ROOSA Yeah man.

MITCHELL Hey Ed, if you feel like configuring the high gain antenna for us, we'd like to set up in a react mode but not select high gain yet. Over.

MITCHELL Okay.

CAPCOM Okay, first off we need the -

SC (garble)

CAPCOM Roger, we need a pitch of minus 40 and a yaw of plus 90. That's pitch minus 40, Yaw plus 90, set in on the dials, Wide beam, manual track, make it wide beam and react but do not select the high gain antenna until we call you.

MITCHELL Okay, Houston.

CAPCOM Roger. And I guess we needed to have the high gain in manual long enough for the antenna to go to those angles then to react.

MITCHELL It's done.

CAPCOM Beautiful. 14, Houston. When you all feel like discussing things? We've got oh - about five or six items here, including a consumables update, and a short update to the procedures on one of the inflight memos, and some discussion on midcourses in general. Nothing very pressing in fact, nothing pressing at all. We would like to get

CAPCOM the P23 scheduled at 164 hours, started within about half an hour, the nominal time. Over.

SC Yeah Bruce, I'd like to go ahead and maybe start that one about now and then, P23 and then get going.

CAPCOM Apollo 14, this is Houston. We'd like you to select the high gain antenna at this time, and Stu, we see that you've got a P52 to run prior to getting to the P23. We suggest you go ahead and go through that and start the P23, more or less at the nominal time.

SC Okay.

MITCHELL Adjust high gain.

END OF TAPE

APOLLO 14 MISSION COMMENTARY, 2-7-71, 0952 CST 163 30 GET, 501/1

CAPCOM 14, this is Houston. Did you call?

SC Yeah, that's affirmed. I want some reacts, Bruce, the antenna's started driving around and around. WOW½ Circles. I'm back on the omni's now.

CAPCOM Okay. We copy, Ed. Stand by.

CAPCOM Apollo 14, this is Houston. We'd like to remain on omnis. You may stow the high gain antenna, manual and wide at Pitch minus 52, Yaw 270. Over.

SC Roger. Manual and wide at minus 52 and 270.

CAPCOM Roger.

SC (garble)

SC Houston, Apollo 14 standing by for the consumables update.

CAPCOM Apollo 14, this is Houston. The consumables update for 162 hours follows: RCS total 48.8, quads in order 48.9, 48.1, 49.6, 48.6; hydrogen 45.7, 45.0; oxygen 73.0, 70.2, 21.6. Over.

SC Houston -

CAPCOM Say it again, 14.

SC Okay. A readback of 162 hours:

CAPCOM 14, this is Houston. We're changing antennas. Stand by, please.

END OF TAPE

CAPCOM Apollo 14, this is Houston, how do you read now, over?

ANTARES Loud and clear, go ahead.

CAPCOM Roger Ed. I didn't get your readback on that consumables update, we switched on the antennas about that time. Were you happy with what you copied?

ANTARES That's affirm, here I'll read it back to you. The only ones in doubt is the 02 tank 3 and, first decimal place, okay GET 162 00 RCS 18.8 order of 48.9, 48.1, 49.6, 48.6; H2 45.7, 45.0; 02 73.0, 70.2, 21.

CAPCOM Roger, 21.6 on 02 tank 3, and when ever it's convenient with you all, we would like to get that post sleep status report and acknowledgment on the post wake up stuff on 162.

ANTARES Roger, I'll have it for you in a minute.

CAPCOM Rogr, no rush.

CAPCOM 14 Houston, we are copying your torquing angles.

ANTARES Okay, Bruce and I'm torquing at 1634837.

CAPCOM Roger Stu, and you can go on with the P23 when ever it suits your convenience.

ANTARES Okay.

ANTARES Houston, 14.

CAPCOM Go ahead 14.

ANTARES Okay, we verify (GARBLE)

CAPCOM You're cutting out Ed.

ANTARES All of the items on the post sleep check list have been completed. Al had 7 hours sleep, Stu 6, Ed 7, and unfortunately the PRD is not available at the moment and we will have to forget about the PRD.

CAPCOM All right here, we copy.

ANTARES Yea, and we've had no medication, we are all in excellent - so just tell the surgeon to set back in his chair and have a cup of coffee, we're fine.

CAPCOM Okay, I'll see if the recovery coffee, or the procedures coffee, network coffee pot is working here, we'll get him a cup of coffee.

ANTARES Have one for me to.

CAPOCM I just did Ed.

END OF TAPE

CAPCOM Apollo 14, this is Houston. On arrival in the optics calibration attitude we'd like to get the high gain antenna and wide beam width manual and we'll see flight plan angles. Over.

SC Okay. We can handle that Bruce.

CAPCOM Roger Stu and could you also verify that you're still on the secondary servo electronics power for the high gain.

SC That's verified.

CAPCOM Okay.

PAO This is Apollo Control at 164 hours, 2 minutes. At the present time we're reading a velocity for Apollo 14 of 3,516 feet per second and we now show the spacecraft 181,300 nautical miles from earth. The flight dynamics officer and the retro fire officer are currently reviewing the status of a midcourse correction at the mid-course correction 5 opportunity. That opportunity for the first transearth midcourse correction occurs about 116 hours, 15 minutes and one of the things that the retro fire and flight dynamics officers are considering is what effect the high 02 flow rate test which will involve some venting of oxygen will have on the trajectory and particularly on the flight path angle at entry interface. At the present time, the retro fire officer says that the angle at the entry interface angle is within the corridor, however, if the oxygen venting is determined to have the effect of moving it closer toward the edge of the corridor, rather than towards the center of the corridor there may be some rethought given to performing midcourse correction 5. Those discussions are in process at the present time and we will probably have a decision one way or the next on midcourse correction 5 within about an hour. Flow and convection procedures as called out in the back of the flight plan for you.

SC Standby. GARBLE. Just a moment, but -

CAPCOM Okay, well let's get that later. Let him use it.

CAPCOM Apollo 14, this is Houston. Just for your information RCS status shows about 131 feet per second, delta -v remaining and SPS is about 510 feet per second. Over.

SC Okay, Bruce. Thank you.

CAPCOM And, looking ahead at the midcourse situation here, we'll have a decision for you shortly on whether we want to burn midcourse 5 or not. Right now its magnitude looks like something on the order of a half to three-quarters of a foot per second, with no midcourses at all coming back. You're gamma is minus 6.97 degrees. If we start making midcourses, 5 they say would be about

CAPCOM a half to three-quarters six is on the order of three-quarters of a foot per second and seven looks like about 2.7 or something on that order reading out. We'll keep you posted. We owe you some detail procedures on probe stowage which will be up later on today. And, when Stu gets through with the P23 we'd like to clarify the status of his biomed harness. We didn't get any data from him up until about 160 hours this morning and then it came in loud and clear.

SC Okay. I think we can clarify that for you.

SC I can verify the biomed harness is okay, Bruce.

CAPCOM Okay. Was it switched on all the time or did you get up and switch it on about 160.

SC You got it right.

CAPCOM Roger. Out.

CAPCOM And 14, this is Houston. I've got some questions on the subject of the AGS again for Ed when he's free and we've also got some news items if you're interested in hearing the news.

END OF TAPE

CAPCOM Apollo 14, this is Houston, Stu. Over.

SC Go ahead Bruce.

CAPCOM Yeah, Stu. If you could leave your noun 49 up there in the DSKY just little bit longer, we could copy. We got the first one okay, we missed the last one here.

SC Okay. The first one 21.2, and the second one was 1.9.

CAPCOM Okay, thank you.

SC And Bruce? I want to verify that the state vector I'm working on now is the - is the TEI the state vector. Is that affirmative?

CAPCOM That's affirmative, Stu, and we'd like to get medium beam width on the high gain.

SC Got it Bruce.

CAPCOM Thank you Ed. Okay, we got that one Stu. Just about 5 or ten seconds is enough.

SC Okay.

PAO This is Apollo Control at 164 hours 24 minutes. Apollo 14 now 180 547 nautical miles from earth and traveling at a velocity of 3528 feet per second. Stu Roosa, on board the command module Kittyhawk, is at this moment performing a mid course navigation exercise down in program 23. Taking sightings and marks on a series of stars. Entering these into the guidance computer which is then integrated by the computer to improve the onboard guidance systems knowledge of where it is. The flight activities officer reports that this activity will probably continue for about 30 minutes, 30 - 40 minutes.

SC Got it. Got it. Got it.

END OF TAPE

CAPCOM And, Stu, this is Houston. We're readying a check point down here, and consequently have no data for a minute or two. We'll call you when we're back in business, otherwise, we'd like you to keep the noun 49 for this next star, Antares, showing until we call you. Over.

SC Okay. I can just write them down for you.

CAPCOM Say, Stu, you'd better hold off on actually making the mark. We want to get the shaft and turning angle off of the displays also.

SC Okay. I'll just stand by one no problem.

CAPCOM Okay, and we're back in business, Stu. You can press on.

SC Well, that was good timing.

PAO This is Apollo Control at 164 hours 32 minutes. Our retrofire officer has just recommended to the flight director and - that we perform midcourse correction number 5. The rationale for doing it at this time, even though it is a very small midcourse - on the order of 7 tenths of a foot per second, is that it appears that doing a midcourse correction at the opportunity presented at midcourse 5 reduces the possibility that midcourses will be required at the 6 and 7 opportunities. At the present time, the spacecraft is on a projectory which would give it an entry interface angle of about 6.97 degress minus 6.97 degrees. This is within the corridor. It is within slightly on the steep side and one of the things the Flight Dynamics Officer and the Retrofire Officer considered in making the decision was the effect of the venting, particularly the venting associated -

CAPCOM - none. If you have a minute, we'd like to get the high gain antenna pointing angles tweaked up for maximum signal strength. We're showing about a pitch of minus 60 and a yaw of 0 as being appropriate. Over.

SC Okay.

CAPCOM You got it, Stu?

PAO An addition to minimizing the possibility that we'll have to do a midcourse correction at the 6 and 7 opportunities performing the midcourse correction number 5, which will be the first midcourse on the transearth leg of the flight, puts the spacecraft closer towards the center of the entry corridor and this maneuver will require about a 2 to 3 second burn on two of the RCS reaction control system quads.

CAPCOM Got it Stu?

CAPCOM We've got it Stu.

SC We've got it Stu.

CAPCOM We've got it Stu.

PAO Stu Roo -

END OF TAPE

PAO Stu Roosa is continuing to take marks on star sightings as part of the midcourse correction - midcourse navigation being performed onboard the spacecraft at this time and we're observing those marks that he's taking and recording them here on the ground. As BruceMcCandless, the CAPCOM, gets the data recorded, he's advising Roosa that he's got it, so that Roosa doesn't leave the data up any longer than necessary down here and can proceed on with the next step. We are planning to do midcourse correction number 5. That maneuver occurs in the flight plan at about 166 hours, 15 minutes, it is not time critical particularly. However at this time it looks as if it will be done pretty much according to the flight plan. At the present time we show Apollo 14 at 179 673 nautical miles from earth, and the spacecraft's velocity of now 3542 feet per second. At 164 hours 50 minutes, this is Apollo Control Houston.

CAPCOM We've got that onealso, Stu.

CAPCOM Okay, we got it. Okay we got it.

CAPCOM Apollo 14, this is Houston, we've copied the last noun 49, value there. And for Stu's information based on the sight he's taken on the first three stars, we're showing that the program and the marks are all working in excellent fashion within one signal of the expected values. From the trench comes the information that your state vector compared with their estimate without any midcourse corrections, which show you arriving at entry interphase four minutes earlier than the MSFN vector at the present time. Over.

SC Okay, we'll see if we can't work on that four minutes.

CAPCOM Roger.

SC And we're going to be playing around here with the program a little bit.

CAPCOM Okay. And when you're through with that and prior to starting your maneuver to the thermal attitude we'd like to go through a normal acquisition procedure on the high gain antenna, hopefully winding up in auto and narrow beam width to verify it's tracking capabilities during the maneuver. Over.

SC Okay Bruce, say again when you want to do this?

CAPCOM Roger. When Stu's through with his P23 and prior to starting the maneuver to thermal attitude. You've got called out - oh, at about one sixty four fifty five. VERB 49 maneuver to thermal attitude. Over.

SC Okay. Will do.

SC And Bruce, 14.

PAO This is Apollo Control at 165 hours 14 minutes. Capcom at this time is preparing to pass up the information to the crew for midcourse correction number

PAO five. At its present time Apollo 14 is 178 831 nautical miles from earth, at a velocity 3557 feet per second. The on board navigation performed by Stu Roosa updating the spacecraft guidance system's knowledge of where it is, is used as part of a backup procedure, in the event that we were not able for some reason to use the computed values for midcourse corrections. Determined here on the ground. The crew would be able to compute maneuvers based on the on board guidance system. And as you heard in the conversation between Roosa and Capcom Bruce McCandless, the onboard values are comparing quite closely, with those that we have computed here on the ground.

END OF TAPE

CAPCOM 14 Houston, if you want to set there in POO and ACCEPT for a minute, we've got the target load and state vector update for you.

SC Okay, we're POO and ACCEPT. I guess we're going to do midcourse 5, huh.

CAPCOM Roger, sorry about that. Yes we will burn midcourse 5 as scheduled, and I've got the midcourse 5 pad for you whenever you want to copy.

SC Okay, stand by one.

SC Houston, Apollo 14, ready to copy it.

CAPCOM Roger Ed. Midcourse correction number 5. RCS G and N. 2 4 5 6 1. Pitch and yaw trim in A. Check 166145854 noun 81 plus 00007 minus all balls minus all balls roll 092 330 009 HA is NA plus 00 189 00007 003 00007 section star 33 2563 135 four side star is NA minus 2703 minus 17262 11588 36251 216 28 03 GDC aline Sirius and Rigel, 230 170 002 plus X 2 jet Bravo and Delta. High gain angles in this attitude pitch minus 90 yaw plus 206. Read back over.

SC Give again the jet (GARBLE)

CAPCOM Jet's Bravo and Delta, B and D over.

SC Okay. Okay, mid course 5 RCS G and N. 2 4 5 6 1. NA NA. At 116145854 plus 00007 minus all zip minus all zip. 092 330 009 NA plus 00 189 00007 003 00007 332563135 NA minus 2703 minus 17262 11588 36251 216 28 03. Sirius and Rigel. 230 170 002 plus X 2 jet B and D. High gain antenna angle pitch minus 90 yaw 206.

CAPCOM Roger read back is correct and were you aware that your now coming back on Wednesday instead of Tuesday?

SC No we haven't considered that fact, but I guess we'll make it up between the splashdown and Houston, right.

CAPCOM Roger, Roger you. After the TEI burn, it looks like you about 3 or 4 miles west of the jog in the international date line, as it comes down through your splash down area.

SC Okay.

CAPCOM 14, Houston, the computer is yours, you can maneuver to the mid course correction 5 attitude without going through the thermal-attitude, that wont be required, and we would like to go through the normal react procedure and the high gain antenna prior to starting the maneuver and see if it tracks. Over.

SC Okay, will do.

CAPCOM And for Stu, we've got 2 minor corrections to the procedures for the heat flow experiment as found in the back of the flight plan.

SC I don't believe it. Stand by one.

SC Okay, I have the procedures out Bruce.

CAPCOM Okay on the heat flow and convec, convection demonstration under step 2, zone low power on. It currently reads 15 minutes, turns out that all thats required here is 10 minutes, over.

SC That's easy, okay under step 2 zone low, power on 10 minutes.

CAPCOM Roger, and down there under step 4, zone high power on its now 10 minutes and you can reduce that to 5 minutes.

SC Okay, 5 minutes under step 4.

CAPCOM Roger, and there's no problem involved in these, its just appears that the color changes in the crystals will saturate at about this time, so rather than using up more power we can just shut it off at that point. over.

SC Bruce remind you there for a minute, let read you right and understand exactly what you want me to do, (GARBLE) go ahead and lock on and react and medium or (GARBLE).

CAPCOM Negitive Ed. We want you to go through a normal manual acquisition procedure winding up in auto and narrow, over.

SC Okay, but I'll already on the high gain right now so I (GARBLE)

SC Okay, then we're showing you minus 109 B D, so we must have lost you on the high gain there or you pointed off as we started the maneuvers.

SC (GARBLE)

CAPCOM Okay, Ed, what we want you to do is to go to auto and wide beam with and, aquire us on the antenna, and then progressively narrow it down from wide to medium to narrow, over.

SC Okay, thank you. Do you have it?

CAPCOM Beautiful. I guess this is a symantics problem here Ed. The encos have been using the termenology of standard acquisition to imply pointing the antenna towards the earth manually, then going to auto and wide getting it to lock up and on down into narrow beam to complete the acquisition, over.

SC Rog, that's what I understand as a normal acquisition, but I thought I heard the word react a couple of times implying a position of the antenna, and I was confused on that one.

CAPCOM Negative, that wasn't our intent.

SC Okay, Houston.

CAPCOM And Stu, this is Houston. We'd like to remind you not to select P37 prior to the mid course correction burn now that we've loaded the data for your burn from the ground, over.

SC Okay.

CAPCOM 14, Houston. You reported to us earlier, that the weight of the ISA as determined on the lunar surface prior to liftoff was 50 lbs. If in your opinion this weight has changed to greater than 55 lbs, as a result of the lem return to CSM stowage, then we'll have to make provisions for tying it down. We'd like to get your feel for what the current weight on the ISA is, over.

END OF TAPE

SC Roger Bruce, we'd say it weighs exactly 54.9.

CAPCOM Okay Ed, we copy 54.9 for the ISA.

SC Houston, 14.

CAPCOM Go ahead 14.

SC The first case on this ISA remember now there are a few program things that are listed in the flight plan that went into it after it was weighed. Are you taking that into account?

CAPCOM Roger, we got the weight at 50 pounds on the lunar surface and can add in, if you like down here those things we were just interested in getting your feel for what it had all been put in and if so what the weight increase would be.

SC Okay Bruce. The same shutter in the flight plan to go into the ISA were added in as programed. And any additional items are almost negligible in weight as - certainly did not violate your five pound. (garble).

CAPCOM Okay, thank you Ed. And if you're interested we've got the morning's news items here. Or alternatively I've got some additional questions on the guidance for Ed.

SC Let's take the news first, and then the questions.

CAPCOM Roger. Okay 14, from Fra Mauro base comes the word that ALSEP package number four continues to function normally during the reporting period ending at 162 hours GET the C3 heater was turned off and a long period calibration of the PSE was performed. From west Fra Mauro comes the report that when Antares ordered in last night the steerable antenna was still locked on sending back high bit rate telemetry, in fine tradition. Anchorage, Alaska.

SC It had to do something to redeem itself.

CAPCOM Anchorage, Alaska. An earthquake measuring between 6.5 and 6.7 on the Ritcher scale occurred near Adak in the Aelution Islands Saturday, but no damage or injuries were reported. The seismagraphic station in Berkeley California recorded the quake at 150 plus14 GET and scientists said it occurred close to the earth's surface. The Alaska State Patrol said the tremor was centered south of Adak and was not sever enough to call for large wave warnings. Stockholm. Italian and a Norwegian born Swede landed at (garble) in 1909 North Pole Expedition of American Explorer Admiral Robert E. Perry right down to fur garments and sleighs, some of the Eskimo guides even claim to be descendents of Perry's original Eskimo crew. Mobilee, Missouri,

SC Need lots of luck on that one.

CAPCOM Mobilee, Missouri, a radio station in Mobilee has tried a number of times to place a telephone call to Alan Shepard on the moon. One operator said "The Moon? Really do you have a number and area code?" Another took it in stride and said "Alright". The newsman asked how long it would take and the operator replied she didn't know and he was discouraged when after asking if he would wait the operator replied" Okay." Many operators laughed but one ended the fun with a rejoiner "Sir, there are no connections for civilians to the moon at this time, we are sorry." George C. Scott and Ali McGraw have been honored

SC And that was the call Al was waiting for too.

CAPCOM George C. Scott and Ali McGraw have been honored as best actor and actress in the foreign press association's 8th annual globe presentations in Beverley Hills, California. Miss McGraw received her award for her part in "Love Story". Scott was selected for his part as General George Patton in "Patton". Houston - at River Oaks Country Club Golf Pro Jack Arden was quoted in this morning's paper as saying that "Al has got a pretty good swing and could be a real good player if he worked at it." Along that line in the other golf news, Arnold Palmer Tom Shore and Dewitt Weaver are all tying for first place in the Hawaiian Open, with scores of 204. That was after a third round yesterday and a final round is to be played today.

SC The only way Al can keep his arm straight though is to wear the suit and that gets cumbersome on a golf course.

CAPCOM Roger that. The Houston Astros have passed the half way point in signing on their new players for the 1971 season. Signed contracts have come in from 23 of the 43 players who are scheduled to see Spring training action. Regulars, such as pitchers Don Wilson and Don Griffin, catcher John Edwards and end fielders Dennis Mackey and Bob Watson and out-fielder Norm Miller are already signed up. Also the Astros have commitments from both their newest acquisitions. From the Chicago Cubs in-fielder, Roger Mestrer and catcher first baseman Jack Hyatt. New Mexico Governor Bruce King and his predecessor David Cardiour are in a dispute over who owns the moon rocks presented to Cardiour by President Nixon. Cardiour's took them when he left office December 31. King said he has asked the former Governor to return them back because I think they belong to the State. Charlotte Amalie Virgin Islands, the U.S. Virgin Islands is planning a semi-ocean floor laboratory Great Lamasha Bay, St. John. To provide a low-cost method of charting the untracked jungles on the world's oceans. The habitat, a large tubular thin chamber cylinder will be modelled

CAPCOM after the one used in the recent technec program and be financed by the Virgin Islands Government and private industry. The Navy says it's first rescue mini-sub has shown it can locate a submarine trapped under water, lock onto it and bring its crew to safety. The rescue will prove itself in test at a depth of more than 150 feet off San Clemente Island. The 50 foot sub located a metal structure representing a submarine locked a transfer hatch over, and brought a man through. They've dubbed the vessel "the green torpedo". On the basketball scene, UCLA put the skids on USC in the big west coast basketball game last night. An account from (garble) the Bruins beat the Trojans 64 to 60. The Houston Cougars had a real battle with Seattle University at the Hoffheinz Pavillion last night. They squeezed out a 93 to 92 win. And the southwest conference action the Rice Owls dumped the Texas Tech Raiders by 80 to 64. Rice smarting from a three game losing streak stopped the Raiders three game winning streak. Tech is number - Tech is a 4-2 for the season, Rice is a 3 and 3. In automobile racing, A.J. Foyt showed his driving prowess by winning the fall position for the big Daytona 500 on February 14. Foyt wowed the crowd as he turned in a qualifying lap time over the two and one half mile oval with a clocking of 182.7. Defending star car champion Bobby Beseck was second with a speed of 180.05 per hour. Foyt, who has never won the Daytona 500 is the favorite now, with Isaac to win 200 000 dollar auto classic. Former U.S. Davis Cupper Arthur Ashe defeated Clark Gretner of New York in a semi-finals of the Ferrai invitational tennis tournament in Richmond, Virginia. And that about wraps up the morning news. Over.

SC That's a very good run down Bruce, very good. And why not give - let us hold off on the answer on the ISA. For a minute. We'll run back over our check out list. And reviewed the

END OF TAPE

SC (garble) doing the same thing down there, we'll get back together with you a little bit later in the day on the good length.

CAPCOM Roger. There's certainly no rush on it. We'd just like to know that prior to entry so that we can determine whether it needs to be tied down or not and if it effects the CG any.

SC Okay. We think the additional items are about 5 pounds and then I'm going back over the checklist and we'll give you a good entry later on.

CAPCOM Roger and when Ed feels in the mood for it, I've got a couple more questions for the AGS.

SC (garble) Go ahead Bruce, I'm ready.

CAPCOM Okay, Ed. When the trouble first showed up, was there anything showing or was there anything left showing in the DEDA and was it possible for you to clear this display, if there was anything showing? Over.

SC That's negative. The first time I noticed that there was a problem, was when you called my attention to it, that, as I recall it, that we knew what the call was but you asked about the, I guess the circuit breaker on the DEDA or on the AGS. That was the first time I ever realized that we had a problem. There was nothing showing on the DSKY, and of course, I could not enter the DSKY or clear it or anything else.

CAPCOM Okay. I guess that about sums it up.

SC There is one comment, I noticed just before leaving the LM there appeared to be a very small crack across the address register on the DEDA. Now, how long it had been there or whether it was bumped after docking or when it occurred, I have no idea. But there did appear to be a crack in the inner glass on the address register.

CAPCOM Okay. Thank you.

PAO This is Apollo Control at 165 hours 45 minutes. The information passed up to the crew on that series of transmissions for a midcourse correction number 5 called for a burn at 166 hours 14 minutes 58 seconds, that will have a velocity change effect of 7 feet per second in the plus extra action, which will be back toward the center of the earth in the direction of travel of the spacecraft. It will require a burn time of about 3 seconds, using two of the reaction control system thrusters. At 2 p.m. this afternoon central standard time, Dr. Brian J. O'Brien, the principal investigator for the charged particle lunar environment experiment on the Apollo 14 ALSEP and Dr. Gary Latham, principal investigator for the passive seismic experiment will meet with newsmen in the large auditorium of the MSC News Center. That will be at 2 pm this afternoon central standard time.

CAPCOM 14. This is Houston. On your waste

CAPCOM water dump scheduled for 166 hours, we'd like you to dump to 25 percent onboard indication. Over.

SC Roger. Waste water dump to 25 percent onboard indication.

CAPCOM Roger.

PAO This is Apollo Control at 165 hours 55 minutes. We're now a little less than 20 minutes away from the scheduled ignition for a midcourse correction number 5. A primary purpose of that maneuver will be to place the spacecraft a little closer to the middle of the entry corridor. It is within the entry corridor at the present time. Without the midcourse correction, the entry interface angle would be about negative 6.97 degrees. The desired angle of entry interface is 6.5 degrees, again negative. And this maneuver will be aimed primarily towards putting the entry interface angle at the desired 6 - negative 6-1/2 degrees. The burn will be performed at 166 hours 14 minutes 58 seconds. It will be a 7 tenths foot per second maneuver using the reaction control system thrusters burning for about 3 seconds on two of the four quads. And at the present time, we show Apollo 14 177 361 nautical miles from earth, traveling at a velocity of 3582 feet per second.

CAPCOM Apollo 14, this is Houston. For systems record keeping purposes, if you have time, we'd like you to run an EMS nobias check and give us the results on it.

SC Just so happens that we have that number. Stand by.

SC Okay, minus 990 is the number.

CAPCOM Roger. We copy minus 990.

CAPCOM 14, Houston. We'd like to get this waste water dump out of the way before the midcourse burn. Over.

SC Roger. We'll start it right now.

CAPCOM 14, this is Houston. We show oxygen still flowing in the fuel cell purge.

END OF TAPE

PAO This is Apollo Control. We're coming up now on 1 minute until our midcourse correction maneuver. This will be a seven-tenths of a foot per second burn using the reaction control system thrusters on the spacecraft.

CAPCOM Apollo 14, this is Houston. One minute until the burn we'd like to terminate the water dump at this time and go ahead and enter on your maneuver there.

SC Okay, we'll be there.

CAPCOM Your slip take is okay 14.

SC We're going to just go ahead and burn it on time.

CAPCOM Okay.

SC Okay, Houston, burn is complete.

CAPCOM Houston, roger, out.

PAO Flight dynamics and guidance officers report that they are happy with that burn. Telemetry data here on the ground showed that residuals in all three axes were less than one-tenth of a foot per second. It'll be several hours before we have sufficient tracking to determine the precise effects of that midcourse correction, desired effect would be to move the entry interface angle from 6.97 degrees to a minus 6.50 degrees putting the spacecraft in the center of the entry corridor. In deciding to perform the midcourse correction at the midcourse correction 5 opportunity the flight dynamics and retro fire officers pointed out that it would minimize the possibility of having to do midcourse corrections at the opportunities 6 and 7. And the decision was made in part on that basis to go ahead with the midcourse correction at seven-tenths of a foot per second midcourse correction at this opportunity. At -

CAPCOM Go ahead 14.

SC Okay, Bruce, I started this maneuver with OPTICS CAL - I don't know if we'll have the high gain there or not - do you want to do the uplink in here? I kind of hate to stop the maneuver. Is OMNI Charlie going to be alright for you for the uplink?

CAPCOM That's affirmative, Houston - 14.

SC Okay, thank you.

CAPCOM Apollo -

SC Go ahead, Houston.

CAPCOM 14, this is Houston. Could you give us the reading on the Delta V counter on the EMS at the end of your burn again for systems tracking. Over.

SC That was 0.3 plus 0.3.

CAPCOM Roger, plus 0.3. Thank you.

PAO This is Apollo Control. Preliminary tracking from that midcourse correction maneuver shows that we've moved the spacecraft a little closer towards the center of

PAO the entry corridor we're now reading minus 6.63 degrees and we would expect that number to continue to change as we gather more tracking information. Based on the same preliminary information entry interface would occur at 216 hours, 27 minutes, 31 seconds which would give us a splashdown time of approximately 216 hours, 53 minutes. Again these times will change as we continue to gather more tracking information, probably by relatively small amounts. At 166 hours, 25 minutes we show Apollo 14 traveling at a velocity of 3600 feet per second, now 176,357 nautical miles from Earth.

END OF TAPE

CAPCOM Apollo 14, this is Houston. Request OMIN Charlie. Over.

SC Houston, 14.

CAPCOM Go ahead, 14.

SC Okay, Bruce are you ready for the uplink?

CAPCOM That's affirmative. We're ready to send you up what will become the CSM state vector after we ship it over and then there will be about a 2 minute delay while we get the MSFN computed CSM state vector that goes in the LM slot out to the side. Over.

SC Okay. We're POO and ACCEPT and standby at your convenience.

CAPCOM Roger. Out.

END OF TAPE

CAPCOM 14, this is Houston. We're through with the uplink. The computer is yours.

SC Okay.

CAPCOM Apollo 14, this is Houston. Over.

SC Go ahead, Bruce.

CAPCOM Say, Ed. We've got some modifications to the high arch and flow tests procedures here, if - that is, if you will advise us when you're ready to copy. Over.

SC Okay. Stand by.

CAPCOM Understand you're ready to copy, Ed. Over.

SC No. Just a second.

SC Okay, Bruce. What page are you going to work on?

CAPCOM Okay. If you look on page 3-245 of the flight plan, the one that starts at 168 hours.

SC Okay.

CAPCOM Okay. There are three steps there that are circuit breaker 02 isolation aux bat close, this is panel 226; 02 tank 3 isolation valve closed momentarily and 02 tank 3 isolation valve talkback barber pole. We'd like to move those three steps up to 167 hours. Over.

SC Okay. The three steps circuit breaker 02 isol aux bat closed; 02 tank 3 isol valve closed momentary, and 02 tank 3 isol valve talkback barber pole. These are set for 167 hours.

CAPCOM Roger. And also at 167 hours circuit breaker oxygen tank 3 50-watt heaters open, 226. Over.

SC Okay. Say it again what you want from one.

CAPCOM Okay. Also at 167 hours we want to open the circuit breaker for oxygen tank number 3 50-watt heaters. That's CB 02 tank 3 50-watt heaters open on panel 226. Over.

SC Okay. You want the tank 3 oxygen tank 3 50-watt heaters open. Roger.

CAPCOM That's affirmative. You may commence the 02 high flow tests at your convenience following Stu's completion of the P-23. Over.

SC I understand.

CAPCOM Item number 3. The new heater redline temperature is 350 degrees Farenhite - that's 350 degrees Farenhite, which corresponds to 3.6 - I'll say it again, 3.6 volts on the system test meter. Over.

END OF TAPE

SC Bruce, say again (garbled) 350 degrees redline, Houston.

CAPCOM Roger, that's the red line on the heater temperature. Over.

SC Okay.

CAPCOM And that corresponds to 3.6 volts on the system test meter.

SC Thank you.

CAPCOM And, Ed, for tank three, that's position one Charlie, on the systems test meter.

SC Okay, thank you.

CAPCOM Okay, some general comments The test should be terminated if communications is lost with MSFN. Over.

SC Understand. Thank you. You mean other than just a drop out.

CAPCOM That's affirmative. If we lose communications for any extended period of time.

SC Okay.

CAPCOM And for your information, the minimum cabin pressure that we are expecting is in the vicinity of 4.4 to 4.2 PSIA. However, if the cabin pressure falls below 4.0 PSIA, you should terminate the test. Over.

SC Okay. Understand you're expecting 4.2 to 4.4 cabin pressure, if it drops below 4.0 we're to terminate the test.

CAPCOM Roger, and if you're unable to terminate more rapidly than is required to keep the cabin pressure above 3.7, then bring the surge tank and repress back on line to maintain cabin pressure. Over.

SC Okay.

CAPCOM Okay Ed, and on the systems test meter. Make that position one bravo, for monitoring tank three which is the one that you should be monitoring. Over.

SC Okay. One bravo, tank three.

CAPCOM And then here's a fairly long one. If tank three heater temperature, or tank one exceeds 350 degrees fahrenheit, place the heater switch to off. I'll go all the way through this once first. When the pressure drops to 800 PSI, place heater switch to on. Monitor tank pressure and heater temperature. Place heater switch to off when pressure reaches 930 or heater temp reaches 350 whichever occurs first. Test will be terminated if heater temp. reaches 350. Prior to tank pressure reaching 850, in this mode of operation. And - I'll go back and start again from the beginning on that one in a minute. Over.

SC Okay. Let's see if we can find a way to codify it. (Garble) a little easier to understand.

CAPCOM Okay, condition number one. If the heater temperature exceeds 350 degrees flip the heater switch to

CAPCOM off. Over.

SC Okay. If the heater temp in tank 3 exceeds 350, heaters to off.

CAPCOM Okay. Under the assumption then that you're up in a normal operating pressure range when this happens, when the pressure drops -

SC Hey Bruce, hold up a minute.

CAPCOM Okay.

SC Hold up a minute. Let's - let Stu complete this P23, and then we'll get back on this. I'm interfering with him by working on the flight plan right now.

CAPCOM Okay, I'll tell you what. Just carry out that stuff at 167 hours, then whenever you're ready to press on with this, give us a yell and we'll go back through the rest of these notes. Over.

SC Okay.

CAPCOM 14, Ed. This is Houston. Since we've already given you the instructions to terminate the test if communications is lost, it might be more straigh forward if we monitored the heater temps and pressures for you down here and advised you of the action required if any off-nominal action is required. Over.

SC Okay, that'll be fine.

CAPCOM Roger, you've got - you got all of it up there now, and if for any reason you should have to terminate why the procedures are over there on page 3-248 they are the nominal termination procedures.

SC Okay Bruce, will do.

CAPCOM Roger, out.

END OF TAPE

CAPCOM 14 this is Houston. We'd like to initiate charging on battery Bravo, over.

SC Okay, stand by.

PAO This is Apollo Control at 116, 167 hours 13 minutes. The crew on Apollo 14 at this time taking another set of marks and sightings for midcourse navigation. When this activity is completted, then they're scheduled to begin the high oxygen flow rate test. In this test a dump valve in the spacecraft will be opened to increase the oxygen flow rate from the current level of about 1 tenth of a pound per hour to about 6 lbs per hour. This is the sort of situation that would be encountered on an EVA, and one of the purposes of the test is to verify that oxygen flow rates, which could be encountered in subsequent Apollo missions during EVA's, will not exceed the delivery capibilities of the tanks. To determine that the service module cryogenic oxygen tanks will be able to deliver oxygen at a high flow rate, particularly later in the missions when, later in the mission when quantities in the tanks are down, and at the present time, the quanity in tank 3 which will be used to supply the high flow rate, is down to about 21 per cent. Apollo 14 at this time is 174 632 nautical miles from earth and the spacecraft velocity 3630 feet per second.

END OF TAPE

CAPCOM Come on now.

SC All right go ahead, Houston.

CAPCOM I was just remarking at Stu's noun 49 value there plus 1/10 zero.

SC Well, you're watching the world's leading expert in P23.

CAPCOM Well, I don't know. Jack Swigert wrote a paper on it.

SC We're aware of that also.

SC Comment still stands.

SC Yeah, that has nothing to do with Al's comment, Bruce.

CAPCOM Okay, I'll pass it along.

END OF TAPE

APOLLO 14 MISSION COMMENTARY, 2-7-71, 1344 CST 167 22 GET, 516/1

SC Bruce, you're also watching the world's leading expert on going from CMC AUTO to free and back.

CAPCOM Roger. We copy that, Al.

END OF TAPE

SC Houston, 14. We are applying power to the Delt nozzle heater. 167 25 and we'll be doing the test in about 30 minutes.

CAPCOM Roger, Houston, roger, out. 14, this is Houston, we show that you're in high gain antenna coverage area at the present time. We'd like you to acquire on a high gain Pitch minus 5 yaw 250, over.

SC Okay, we're shooting for that now. We're at Pitch minus 5 yaw 250.

CAPCOM Roger out.

SC Okay, you should have it now, Houston.

CAPCOM Roger, Al, we've got you loud and clear.

PAO This is Apollo Control at 167 hours 38 minutes. At this time in the MSC news center in the main auditorium Dr. Brian J. O'Brien, and Dr. Gary Latham, principal investigators for ALSEP Experiments, will meet with news men to answer questions about their respective experiments. Dr. O'Brien is the principal investigator for the charged partical lunar invironment experiment, and Dr. Latham is the principal investigator for the passive seismic experiment.

CAPCOM Apollo 14, Houston.

SC Go ahead Houston.

CAPCOM Roger, Al. I just wanted to say, that I get a chance to say Hello on the network, you guys did a great job yesterday, and I think things are in beautiful shape coasting home.

SC Well thank you, Thomas. Appreciate those kind words. We're coming along well up here too right now.

CAPCOM Yeah, Stu's marks looking real good, and we had a great team effort on that landing, we'll tell you about it. In fact, I nearly lost all of my hair, would you believe that.

SC No, that would be pretty hard to believe, Tom.

CAPCOM Rog.

SC Now we're pressing Ed, with the flight plan items here, and we're staying busy.

CAPCOM Roger.

SC Houston, Apollo 14.

CAPCOM Go ahead, Ed.

SC Okay, back to our IFA weight problem.

CAPCOM We didn't know we had a problem, but go ahead.

SC Okay, I'm being jumped on by both sources here, it's not a problem, it was a question. The IFA contains the 50 lbs we measured on the surface, less the 100 foot tether plus the 70 mm camera and magazine, plus the pair of EVA gloves, plus the return rate ups on Deek's list.

CAPCOM Okay Ed, we've got that, and we'll work the arithmetic on the weights from down here and keep you advised, over.

SC	Thank you, sir.
CAPCOM	Roger. Out.
SC	There you go, Bruce.
CAPCOM	Okay, Stu. We copied that one for posterity.

END OF TAPE

SC You got the last number?

CAPCOM Yeah, we got that one too Stu, but you only get the first one framed and authenticated.

SC Okay.

CAPCOM You still on Delta Sagitaria?

SC That's negative, that was the last mark on Antares.

CAPCOM Roger.

PAO This is Apollo Control at 168 hours 2 minutes. The crew aboard Apollo 14 appears to have completed the program 23 mid course navigation, we'll be standing by now for them to begin the high oxygen flow rate test. Essentially this test will involve opening a valve on the spacecraft, increasing the oxygen flow rate from the current level of about one tenth of a pound - one tenth of a pound per hour, to about six pounds per hour. The primary purpose of the test will be to determine the ability of the service module cryogenic oxygen system to deliver oxygen at a high flow rate such as will be required during in flight EVAs, and future Apollo missions. And particularly when the oxygen level in the tanks is at a - a low level. At the present time the oxygen tank three which will be providing the source of oxygen for the high flow rate test, the quantity is down to about 21 percent. At the present time Apollo 14 is 172 918 nautical miles from earth. The spacecraft velocity is 3662 feet per second.

END OF TAPE

SC Houston, Apollo 14.
CAPCOM Go ahead, 14.
SC We're starting the 02 test now the heaters are going to AUTO. Opening up the flow valve.
SC (garble) we're standing by on the flow valve (garble)
CAPCOM Okay. Understand heaters to AUTO and you're standing by on the flow valve.
CAPCOM Have you got the REPRESS package valve OFF?
SC Yeah. Changing that now.
SC Okay Houston. The plug is up; we're flowing at 1680950.
CAPCOM Roger, 14.
SC The screen has been installed on the adapter.
CAPCOM Roger, the same.
CAPCOM Apollo 14. Stu, this is Houston.
SC Go ahead, Houston.
CAPCOM Okay. We continue to get praise of your ability on the P23s based on your navigation, your idea of your gamma angle at entry interface is minus 6.1 degrees. The MSFN solution corrected for the midcourse 5 burn but without any post midcourse tracking is 6.6 degrees. Over.
SC Okay. I noticed I was comparing a VERB (garble) there Bruce and I showed 625 miles or there abouts prior to those last two sightings and then it was down to, I don't know - I read some - after those. I think the sightings on the moon is what really help bring it in and there were a couple of large updates there I think that really helped it.
CAPCOM Okay. That sounds like you're doing good work.
SC Thank you.
CAPCOM 14, this is Houston. On telemetry, we're showing a cabin pressure of 4.7 right now and wonder what you've got?
SC That's about 4.8 what we've got, Bruce.
CAPCOM Roger, out.
CAPCOM Okay 14, Houston. Now we're showing the surge tank at 750 on our telemetry now.
SC As a matter of fact, we were just going to call you on that. We have a bias on our gauge, that's good, we'll stay with - we're going to start the test at 168 30 16829, I'm sorry, 1683000 - surge tank valve going on.
CAPCOM This is Houston, Roger, out.
PAO This is Apollo Control at 168 hours 32 minutes. We've been in this oxygen flow rate test now for

PAO about 20 minutes. The spacecraft cabin pressure is down to 4.5 pounds per square inch and appears to be leveling off there. The test is scheduled to last for about 3 and 1/2 hours. Also the Flight Dynamics Officer and Return to Earth Officer have computed some additional information on the result of the midcourse correction performed at the MCC-5 opportunity based on the preliminary tracking we would expect entry interface to occur at 216 hours 27 minutes 34 seconds with a splashdown at 216 hours 41 minutes 35 seconds and the preliminary splashdown coordinates are 27 degrees 2 minutes south, 172 degrees 38 minutes west which is about 8 minutes west of the international date line and would still at this time put the splashdown, local time on Wednesday. Of course, the Greenwich mean time for splashdown would remain the same. And there's also a good possibility that with additional tracking as the tracking vectors are updated with additional information, that we'll find the splashdown point moving back to the other side of the international date line and giving us that Tuesday, local time splashdown. At the present time we show Apollo 14 171 822 nautical miles from earth and the spacecraft velocity 3682 feet per second. Flight Director Milton Windler just checking with his EECOM now on the status of the spacecraft cabin pressure and EECOM reports that it appears to be leveling off at that 4 and 1/2 pound per square inch pressure. At 168 hours 34 minutes, this is Apollo Control.

END OF TAPE

PAO This is Apollo Control at 169 hours 2 minutes. Oxygen tank number 3 appears to be doing a credible job of maintaining a high flow rate. We're still steady at 4.5 pounds per square inch cabin pressure. The nominal, with a normal flow rate of about 1 tenth of a pound per hour is up around 5 pounds per square inch. Once we initiated the high flow rate opening a valve in the spacecraft to increase the flow rate over board, the pressure in the cabin drops to about 4.5 and it's been holding there ever since. The test has been in progress now for about, a little under 1 hour.

CAPCOM 14, this is Houston. We'd like you to zero the optics please.

SC Okay, stand by. Okay, you've got it.

CAPCOM Roger, thank you.

SC Go ahead.

PAO This is Apollo Control at 169 hours 33 minutes. Apollo 14 now traveling at a velocity of 3,722 feet per second, and 169,688 nautical miles from earth. The high oxygen flow rate test has been in progress now, for a little over an hour and 20 minutes, and we're still showing a stable cabin pressure at 4.5 pounds per square inch. The oxygen flow rate tests are scheduled to continue for a total of about 3 and one half hours, or up to about 171 hours, 10 minutes ground elapsed time. The test, however, was begun at about 168 hours 9 minutes and could run a little bit beyond the 171 hours. This is Apollo Control, the cabin pressure is maintaining at about 4 and a half pounds per square inch, however we do show a drop at this time in the manifold pressure which supplies the cabin. This has been a gradual steady decrease in the manifold pressure, and at this time the ecom is evaluating whether or not to terminate the flow rate test. Flight Director Milton Wendler has gotten the recommendation that we will terminate the test at this time, and Capcom Bruce McCandles is preparing to pass that recommendation to the crew.

CAPCOM Apollo 14, this is Houston, over.

SC Go ahead, Houston.

CAPCOM 14, this is Houston. We're showing an 02 manifold pressure of 8 pounds per square inch absolute, and we'd like to terminate the 02 high flow test at this time. Further procedures found in your flight plan opposite 171 hours 00 minutes GET, deleting the 10 minute step - deleting the 10 minute restriction in there, over.

SC Okay, at 171 hours we go through termination procedures, got you.

CAPCOM Roger.

PAO Our telemetry data shows that the crew has put the surge tank on the line, part of the normal test termination procedure and we should show the cabin pressure

PAO start to come back up from 4.5 pounds per square inch to something closer to the normal flow rate of around 5 pounds per square inch.

CAPCOM 14, this is Houston. We show the surge tank on the line and the manifold pressure back up in the normal operating range and we'd appreciate it if you'd advise us when you have the oriface closed off, over.

SC Roger, it's closed off now.

CAPCOM Roger, thank you.

SC Bruce, what was the reason for terminating the test? I didn't quite understand it.

CAPCOM Okay, the pressure in the 02 manifold which normally is regulated 85 to 110 got down to 9 PSI a, and the pressure in your water tank was falling off from below its regulated range because of the pressure in the manifold, and we just thought it best to terminate the test at this time and reexamine the data that we've got on the plumming leading down to it and we'll be back to you with some info on it later, over.

SC Okay, we understand, thank you.

SC Houston, 14.

CAPCOM Go ahead, 14.

SC Do you want us to stay in this attitude, or go on to the thermal attitude?

CAPCOM 14, this is Houston, remain in the present attitude until 171 plus 30 and then maneuver to the thermal attitude, over.

SC Okay, and what about the isolating of the tank? Do you want to go ahead with those 3 steps or do you want me to hold off on those?

CAPCOM Stand by on that, Ed. We'll have the answer for you in a minute.

CAPCOM 14, this is Houston. Affirmative, press on with the tank 3 isolation valve opening, over.

SC Roger.

END OF TAPE

PAO This is Apollo Control at 170 hours, 5 minutes. The spacecraft cabin pressure is back up now to about 4.8 pounds per square inch. Continuing to increase gradually towards the normal 5 to 6 pounds. The high 02 flow rate test which began at 168 hours, 9 minutes, and 50 seconds when Al Shepard announced that the plug was out or the valve had been opened to increase the flow rate through the cabin from normal 1 tenth of a pound per square inch that we had been seeing to that point to about 6 pounds per square inch. And at 168 hours, 30 seconds the surge tank pressure dropped down to about 750 pounds per square inch, which is the criterian for beginning the 2 and 1/2 hour time on the flow rate. Normally the test would have been concluded 2 and 1/2 hours after the surge tank pressure had dropped to 750 pounds per square inch. However, the test was terminated and at 169 hours, 38 minutes, 40 seconds or after a little more than 1 hour, 8 minutes we finally noticed that the manifold pressure, which supplies the cabin, had dropped from the normal 85 pounds or so to about 8 or 9 pounds. The cabin pressure at all times stayed steady at about 4 and 1/2 pounds, which is about what was expected. At this time the preliminary indication is that the flow rate may in fact have been greater than the system could reasonably be expected to provide coupled with the dump rate and use of the urine dump system by the crew is in fact, the flow rate, which was demanded of the system was greater than could reasonably be expected. The manifold pressure would in fact drop, giving us the indication that we saw. The cryogenic system throughout the period of the test that was conducted did appear to be providing an adequate flow rate to maintain cabin pressure at 4 and 1/2 pounds per square inch. And there'll be additional engineering evaluation of the detailed data that was collected during the test in determining whether the test accomplished its objectives or not despite the early termination. At the present time Apollo 14 is 168, 405 nautical miles from earth. And the velocity continuing to increase slowly. Now up to 3, 747 feet per second.

CAPCOM Apollo 14, this is Houston. Over.

SC Go ahead. Houston.

CAPCOM 14, this is Houston. Back when you all ran that P37 about 1 hour ago we took your state vector and ran it through our computer here and we got excellent agreement between the two solutions. We both showed a .9 foot per second mid-course and the entry interface times were within 1 second of each other. The reduction here shows that the measurement plane error in the star sighting themselves was less than 3 arc minutes. So it's really looking beautiful.

SC 3 arc minutes, huh?

CAPCOM Right.

SC That's very good, Bruce. Thank you.

CAPCOM And with respect to the 02 high flow test, the feeling down here is that low pressure in the manifold was probably connected with some panel 251 activity giving a higher flow rate. And if Stu's around we'd like to discuss for a minute his plans on the demonstrations. Over.

SC Okay. He's - Here he is now. We'll put him on.

SC Houston, 14.

CAPCOM Okay, Stu. We wanted to just get a status report on the demos if you've been doing any work on them on the way home, there, and see what your plans were for the TV show this evening.

SC Okay. Why don't you give us about an hours on that. I'm just in and out. We've been running some of the metal composits, but that's nothing to do with TV. All we're going to do there is just show the experiment and talk a little about it and when you called I was putting up the heat flow experiment. We're going to take a look at that one and the liquid transfer and get a hand on it, so I'll have some word in about an hour.

CAPCOM Okay. We're standing by for the TV at the regular time and if you could tell us which ones of the metal casting that you've already run, why it might be of interest to people down here. We caught number 4 on the way out.

SC Yes. We've run 4, 5, 6, and 7 will be the next one.

CAPCOM Roger.

SC Houston, Apollo 14.

CAPCOM 14, this is Houston. Go ahead. Over.

SC Just to clarify a point. We're still planning on starting the TV show at 172:30, is that correct?

CAPCOM That's affirmative.

SC Okay. Thank you.

END OF TAPE

CAPCOM 14, this is Houston. Over.

SC Go ahead, Houston.

CAPCOM Okay. We'd like to confirm that you did in fact turn the heaters and oxygen tank number 1 OFF for the continuation of our 02 low flow test here.

SC We're working on a 50 pound instrument error on that. I think we're reading about 865 right now. How do you look?

SC Okay. We're reading a little higher down here. Got about 889 showing on the TM.

SC Okay. That's fine, we'll turn it off now.

CAPCOM Okay, Roger. And for Ed the folks in Kings Inn Court wanted me to say Hi.

SC Understand you want Ed on the line.

CAPCOM No, just pass that on to him and you might remind Stu to listen to his music.

SC Yeah. We - we're listening to the music.

CAPCOM Okay.

SC Houston, 14. This is Ed. You're calling.

CAPCOM Ed, this is Houston. Go ahead. Over.

SC Roger, did you call me?

CAPCOM I just wanted to say that the folks in Kings Inn Court said to say "Hello".

SC Thanks Bruce. Appreciate that.

CAPCOM They'll be watching during the TV demonstration here.

SC Very good. We've got the camera out right now as a matter of fact.

CAPCOM Okay.

SC Give us it.

PAO This is Apollo Control at 170 hours 51 minutes. We're in the midst of a shift handover in Mission Control at this time and Flight Director Gerry Griffin coming on to replace Flight Director Milton Windler. The Capsule Communicator on the coming shift will be astronaut Gordon Fullerton. And at the present time, we show Apollo 14 traveling at a speed of 3777 feet per second, now 166 832 nautical miles from earth. There will be a Change of Shift Press Briefing. We estimate that it will begin in the MSC News Center in about 15 to 20 minutes.

CAPCOM Apollo 14, Houston. Over.

SC Go ahead, Houston.

CAPCOM Ed, if you have a couple of minutes we have a short test we'd like to run on the high gain antenna to answer the questions that the antenna people have and try to tie down a couple of questions that are still in their mind about it.

SC Okay.

CAPCOM Okay. What we'd like you to do is set the dials to PITCH of plus 25 and YAW plus 265 and then go to MANUAL and wide and then switch to the primary high gain servo electronics and try to make a normal reacquisition on the primary electronics and hopefully if its working we'll wind up once you acquire back up in AUTO and narrow. If you have any problems and it won't work properly just go back to secondary electronics and back essentially in the mood you are in now. They want a one final check on whether primary electronics had indeed failed or not. Over.

SC Okay.

SC Houston, 14.

CAPCOM Go ahead.

SC Okay. It seems to have popped right up very nicely this time.

CAPCOM That's in primary, right?

SC Yes sir.

CAPCOM Okay. We'd like to just stay in PRIMARY then, please.

SC Okay.

CAPCOM Okay Ed. That's really all they had to ask you to do. If you have any sort of failure AUTO track and PRIMARY then go back to secondary. Over.

SC Will go.

PAO This is Apollo Control. We're going to take down the air to ground line at this time for the Change of Shift Press Briefing now about to begin in Building 1 small briefing room. We'll record on tape any air to ground communications that take place during the press conference and bring the line up live after conclusion of the press conference. At 171 20 ground elapsed time, this is Apollo Control.

END OF TAPE

PAO This is Apollo Control at 171:38 ground elapsed time. We've got some accumulated tape during the press conference, and we'll play catch up with the tape and go live.

CAPCOM Apollo 14, Houston.

SC Go ahead, Houston.

CAPCOM Yea, how's your health up there today?

SC Oh, we're just fine, Deke. Everybody's in great shape. We had a little sleep last night. Everybody's a little bit tired after 2 full days but we're fine now, and we're making preparations to run the TV show here. We're playing with the experiments a little bit ahead of time to get organized, and we're just going along fine.

CAPCOM Outstanding, you guys did a beautiful job in sound great.

CAPCOM We've got one -

SC Okay, thank you very much Deke.

CAPCOM We've got one quick question here. Wanted to know how you feel at this point about doing that Q and A with the press tomorrow.

SC Sounds good to us. No problems at all with that.

CAPCOM Okay, real fine. Well we're looking -

SC We'll try to work out a time - We'll try to work out a time somewhere in the timeline when it's convenient for everybody, the people on the ground and for us also.

CAPCOM Okay, well flight thinks about 195:30 looks like a good time from all respects down here.

SC About 195:30

CAPCOM Roger.

SC Stand by.

SC Looks pretty good to us Deke. That's good spot in the time line from our point of view also.

CAPCOM Okay, real fine and they'd like to have TV with that. That gives us good coverage out of Goldstone for that.

SC Okay, we'll plan on that then.

CAPCOM Okay, great Al.

SC You sound pretty good yourself. How's your sleep level these days?

CAPCOM Well, I gained on you last night. I picked up about 12 hours.

SC Ho ho ho.

CAPCOM Talked to your bride today and saw her yesterday. Everybody's doing great family wise.

SC That's good, thank you sir.

CAPCOM You bet.

CAPCOM Apollo 14, Houston, over.

SC Go ahead.

CAPCOM We'd like to have you go to the thermal

CAPCOM as shown at 171:20 in the flight plan, over.
SC Wilco.
SC Houston, 14.
CAPCOM Go ahead, Ed.
SC The flight plan showing a narrow dead band. Is a wide band dead band good enough right now?
CAPCOM A wide dead band will be good.
SC Roger, thank you.
PAO This is Apollo Control, 172:15 ground elapsed time. Some 15 minutes away from the television transmission of the inflight demonstrations from Apollo 14, which are sort of a scientific show and tell. The zero gravity in flight demonstrations involve several pieces of equipment, time lapse photography, and other techniques, for investigation of how weightlessness affects various types of fluids, gases. Among these demonstrations are electrophoretic separation, heat flow and convection, liquid transfer and composite casting. In the electrophoretic separation demonstration could lead ultimately to a method for processing and manufacturing new vaccines and other biological preparations on manned space stations. Only a small portion of the total time involved in these demonstrations can be shown in the TV transmission tonight, because many of the investigations take an hour or more to completely run. The heat flow and convection demonstration is aimed at showing how various types of fluids and gases will flow in weightlessness. This particular demonstration will be photographed at 1 frame a second with the motion picture camera in a time lapse technique. It will be photographed for a total of an hour and 28 minutes. The liquid transfer demonstration looks into the effects and benefits of having baffles inside of tanks. In zero G the fluids tend to cling to the sides of tanks and it is thought with adequate baffling or slosh plates inside of tanks, this particular phenomenon can be off set.
CAPCOM We're ready for you to terminate the charge on battery B.
SC Okay terminating B at this time.
CAPCOM Roger.
PAO In the composite casting demonstration, metal alloy with a very low melting point will be used to get a handle on how materials, not only metals but composites would chop fibers, or wire stiffning inside the composite casting would behave from a manufacturing stand point. 18 sealed capsules containing these materials will be placed in a heater and allowed to cool and brought back to earth for examination. We're still up live on the Apollo 14 air ground loop. About 10 minutes away now from the television. At 172:20 this is Apollo Control.

END OF TAPE

SC Houston, Apollo 14.

CAPCOM Apollo 14, Houston. We're getting a very nice picture of Apollo 14's patch. Over.

SC Very good. How are you this afternoon, Gordon?

CAPCOM Fine. The gold team's at your service and standing by for your show.

SC Okay. We'd like to welcome you to an afternoon with Apollo 14. A Sunday afternoon, by the was, with Apollo 14. And we're going to present some experiments for you. Our narrator for this afternoon will be Stu Roosa and I guess he's about ready to go. Stu.

SC Okay, Houston. What we'll try to do this afternoon is show you 4 of the experiments that we're carrying onboard and even though we'd like to think that they're a major breakthrough - essentially what these are, are experiments to checkout not only the steering involved in the zero g environment, but also the technical problems that we may face in designing bigger and better experiments for Skylab. Three of these experiments deal primarily with convection or in our case lack of convection we hope, during the zero-g. And now for the purists of you in the audience that say we should be calling it zero-g, we'll conceed to that and go ahead and call it zero-g anyway, just for clarification and everybody knows what we are talking about. But really what we're talking about is a free ball situation or the lack of weight. So, of course, on earth under a one-g field when you heat something, air, soforth, why we say air rises and this due the influence of gravity on the air that becomes less dense and the cold air comes underneath it and you have your convection patterns, which ever one it's familiar with. Well, under our situation, we probably have a lack of or we do have a lack of these convection patterns and we're going to use this to show some experiments and hopefully how in later missions that we can manufacture products and perhaps medicines and soforth. And the first one of these is the heat flow - it's a heat flow experiment that we've got mounted over here, if Ed will put the camera on it. And what we have here are various cells and maybe Al can point them out there, on the radial zone and inside each one of these zones as outlined here is a heat sensitive material and it will change colors as it's heated and they'll not all change at the same time due to the substance that sensor is made out of. However, these two are exactly the same. And now under a g field if you had these two the same and you heated them, well, of course, the hot air would rise and let's say that you had this sitting on the table, the one above it you would see a marked difference in the heating patterns. Here under our weightless condition the pattern should be the same, in other words, in these two cells the heating should go out evenly on both sides. Now you will see a difference on these two because the sensor being a different material. So if Al will throw on the switch, SC - - and we'll see some response from this. It'll take about a minute and while we're waiting for that we have essentially the same thing in a different form across the top and we can only heat one at a time, so we'll heat up this radial zone first. I think you'll have a better chance of seeing this. And then maybe we'll throw - heat this up and throw it on - put the TV camera on them later. And while that's heating up, I'd like to show you another one that we've got. Okay.

SC Houston. Color checkup. Has the color in the picture now -

CAPCOM We're getting a pretty good picture, Ed. But we're not noticing any difference in the crystals and the circular heat flow crystals there.

SC - - so you wouldn't.

SC Over here, we've got a - another experiment. Well, let's take another one of the convection types. Let's take the metal castings there, Al. Okay. Al now's got another experiment which we call metal composites. So we have 18 different samples. These samples are metal and really what this experiment is is to get some data - Okay, how's that picture now, Gordon. Can you see the metal composite experiment?

CAPCOM Yes. Now, I have settled and we're seeing it very well.

SC Okay. What we have are 18 of these small canisters. Each one containing a different metal and/or a mixture. And the purpose of this experiment is to get some data on casting under our weightless or zero-g conditions and here again, when you cast metals you heat them and when they cool you have convection currents in them. Hopefully, here in our laboratory we can heat these and cool them. They will have even cooling and also another part of this experiment is, some of the metals are mixed with fibers and/or various other particles. And the theory here to increase the strength of the casting with these fibers. Now on earth under a 1g field, this gets to be a rather difficult process because during the cooling the fibers settle out and you don't get a homogeneous mix and a cooling, so you don't have equal strength. So what we do is, we heat these up and then we run through various processes. Some of them we shake, some of them we don't shake, and then we cool them. We put them on a little heat sink here, and we'll let it set and cool for a certain period of time and then we'll change it, put in another casting, and press ahead. There's really not much else to show on TV with this one. It's - It takes quite a bit of time, by the time we run through all the castings, but we just park it up in the tunnel out of the way and when our kitchen timer goes off, why, we'll either cool it or put in a new casting and press ahead. And I see the - getting some action on

SC - - the convection experiment over here on the radial experiment and we're being real curious Gordon, if you can pick this up and if we've got enough light.

CAPCOM Yes, Stu. We can see a difference particularly on the - as we're looking at it - upper left quadrant of the radial - - window there.

SC Okay. Now, as I said before this quadrangle will heat faster, so you'll see more of - a faster color change. Now these two will also heat and these are the two that really show our zero-g condition, because these two will - and/or heating out the extended radial distance out at the same rate. So, we're not getting any help on either one of them from the convection currents. And the fourth one is just now starting to pick up. And we'll drop off from that one and just let it extend out a little bit and we'll talk about another experiment we have that also deals with convection.

CAPCOM Roger, Stu. It's very apparent that the upper right and lower left quadrants are heating equally. That's a very good picture.

SC Okay. And we - we did run this experiment on the ground - the fourth light, and it was - it was very marked difference. It's quite impressive how it working - -

END OF TAPE

SC it's a very marked difference. It's quite impressive now it's working.

CAPCOM Roger.

SC You do understand that this quadrant down here is a higher temperature crystal. That's the reason that it's not going out as fast as the one in the upper left corner. It has nothing to do with the gravatational effect at all - with the higher temperature crystal down here.

CAPCOM Roger, Al.

SC Okay now, Gordon. Our intrepid LMP is holding another experiment and how's that picture look? Can you get anything of Ed and the blue box here?

CAPCOM We're not getting it yet. It looks like you're still getting the camera settled down. Now - Now we're seeing it - that's right in the center now.

CAPCOM I think maybe if you stop the lens down the little window is overexposed with respect to the rest of the scene so change it - it's not much more than just a bright light. That's looking real good now. I think that's a good setting right there.

SC Okay Gordon. And what we have here is an electrophoresis experiment and we're not going to run this one on the TV camera. It's a one shot operation. But on the left side here we've got three channels going across this beauty and over on the left, in a chamber, we have three different compounds containing organic molecules. And what we're going to do is apply a voltage to each one of these chambers and then open up the partition between the chamber where the organic molecules are and our channel going across. And the theory here being that as you charge the molecules they will move out across this channel. Now some molecules will take a better charge than the other ones and they will move faster. Well, under a gravity field, here again you have a convection current and it tends to mix up the molecules - the heavier molecules settle out to the bottom of the channel - they don't make it all the way across and so forth. All the problems involved with the convection again, so here hopefully, the only variable will be the different type of molecule. And we hope the molecules will then separate themselves in bunches based on the assumption that all molecules of the same kind you know are all been doing their physical conditioning and will run as the same rate. So anyway, the molecules will move across and hopefully will separate them into bands. Now we've got three different types of molecules here and one the simplest one - it's just a red and blue dye and this phenomena will take place under a gravity field and just happens on the earth. And we

SC work up in numbers up to quite heavy molecules and these are the ones that we cannot do on earth and we're trying to see if it's possible to do them here under the zero-g and there are quite a few ramifications to this if it really comes off and one of the most obvious is in the field of medicine in making pure vaccines and so forth. Now we don't expect this experiment to solve the problems. We're trying to get a hack see if the theory is correct and also to work out some of the engineering details such as when you heat - apply this voltage you form a few gas bubbles around it and so we have to have a little pump that circulates the fluid in a very low rate and we want to see if this works and if it disrupts the travel of the molecules. So this we hope is the first step for bigger and better experiments and eventually a truly manufacturing process.

SC Ed, if you want to move on down closer to that light for a few minutes we'll put you on the camera and maybe your family can see what you've got hanging all over your face.

SC We couldn't talk Ed into shaving this morning.

SC Or yesterday morning either.

CAPCOM You might open up the lens slightly if you're going to a less brightly lit object.

SC Are you trying to say Ed's not very bright, Gordon?

CAPCOM I guess I won't comment on the interpretation there.

SC Okay.

SC I'm being conspired against.

SC Since I'm being conspired against, I'll take the camer back.

SC Okay. We'll come back down on to one that does not deal with the convection principle and that's the transfer of liquid. If I can get out of the way here - is that showing up, Gordon?

CAPCOM That's pretty good for centering, Stu. Can we -

SC Okay. We're watching it.

CAPCOM That's looking pretty good. You might move the camera down slightly now. It's in the lower part of the screen. Okay. It's centered well - it was. Also you might try peak on the camera. Might improve the exposure, that was one suggestion from the background man.

SC Okay.

SC You have peak. How's it now? Peak and F:8.

CAPCOM I think that'll work. You might open it slightly, Ed. Open the F-stop slightly and I think we'll have it.

SC Okay. What we've got Gordon is of course two tanks here and these have no baffles whatsoever and we tried to transfer the liquid from one end to the other and then back again and we ended up in about the condition that you see here not being able to do much with it. And I've got me a handy dandy pump which I'm going to mount on here and this experiment is of course planning towards the large space station refueling operations, transfer of fluids on a space station - anytime you have a rather large complex structure up here why you're going to have to be doing this type operation and it's a first look at what type of baffles we'll need and you'll see this on the other side. What I'd like to show you is the difficulty you have when you're trying to do it without any - without the aid of any baffles.

CAPCOM Stu, we see a couple of large bubbles in each tank. Will you point out just which part there is liquid and which part is the air space? Over.

SC Okay. The white portion you see is the bubble and you should be able to see a green fluid around the bubble. Can you see the green?

CAPCOM That's right. We can see where you're - the parts that you're pointing out there. The colors are our monitor here are not coming in true but that shouldn't hurt the point of the experiment. Go ahead.

SC Okay. We'll now take - yeah - okay. And we'll - Al's now working this pump and - okay. We can't even get the bubbles - -

END OF TAPE

SC Okay, we can't even get the bubbles to change too much here. Okay, if you'll watch that, about all you can succeed in doing when you pump with the pump is making the large bubble in the center and the fluid has a tendency to cling around to the outside edge due to the surface tension. Now, this surface tension is quite important, and that is what will make the baffles work as you see on the other side. But right now, the only surface for the fluid to cling to is right around the edge of the tank, and sure enough, that's where it goes, with the bubble in the center. It makes it very difficult if not impossible to work with.

CAPCOM Okay, that's very apparent from the picture we're seeing now.

SC Okay, and a little bit on the hardware here. We have a valve up here at the top that connects the 2 tanks through a tube here. Now, Ed, if you can get it down, and we've got a valve on each - on the top of each tank here in which the pump will either pump into this tank or suck from that tank into this tank. The tubing here goes from these valves through a little hand operated pump. So that's the engineering behind it, and of course as you can see, the liquid just clings to the periphery of the tank due to the surface pitch. We'll now switch the tank and show you the operation using the baffle.

SC Okay, Roger. Switch and I'll put the camera on Al, and let the world look at him. He did shave this morning. It didn't help a bit.

CAPCOM Roger. We can see that none of you look worse for the wear on the preceding 3 days activities.

SC No, we feel great up here, great shape.

CAPCOM Stu, a reminder, if you still have the heat on the radial experiment, you might turn it off. It might be overheating by this time.

SC You might swing on over. There's another part of the experiment that we're not sure you'll be able to see that we turned on - I don't know whether Ed can get it on the camera or not, I'll push the top in. Okay, now up here we have the, down here of course where we're heating and extending out radiantly from a point here. Okay, up on the top we're heating - stand by 1, here, we'll get the camera rigged up. Okay, we've now switched to the zoned cells, as they're called, and there again we have the different crystals.

capcom Ed, can you refocus there. As you moved in tight, we lost the focus and lost most of the detail of that part of the experiment.

SC How's that, Gordon?

CAPCOM Okay, that's better. I think that range is good. Just hold everything as it is.

SC Okay.

SC Okay, Gordon. Now this is essentially the same principle only a different type heating arrangement. Here we're heating with a band in the center, and we have the crystal in longitudinal strips running out from the center. And you probably - I don't know if you can pick up the color difference or not on these bands as they move out.

CAPCOM We can see a little bit of difference there, but it's not readily apparent, but as you point it out, I believe we can see those zones moving out.

SC Okay, and that's it basically, now when we actually do the experiment for data, we have a 16 millimeter camera that sits out 1 foot and we turn it on and it takes a picture and you go through a sequence here so it's a detailed experiment in which we have the procedures as we run through those and what we're doing here is just showing you the gross features of the experiment and its typical operation. We're not trying to show you exactly how we gather the data or anything like that. And we're turning off the heat convection experiment now.

CAPCOM Roger.

SC Okay, how are we focused on the tanks now, Gordon? Stand by.

CAPCOM Okay, Stu. That looks really good. I'm just center it up slightly and we can see the liquid and the baffles very clearly. Over.

SC Okay, just to point out that we've got 2 different type baffles, I think you probably see the baffle, on this side and over on this side there are 2 baffles running up and with a little different feed in arrangment. on the bottom of the baffle. Okay, now, I'll steady up the camera, and Al will supply some power on the pumps, and you'll see the liquid now moving out and due to the surface tension on the baffle, it clings to the baffles and comes out and fills up the tank in an orderly fashion instead of going up the side walls and leaving that large bubble right in the center.

CAPCOM That's a beautiful demonstration. It's very clear from here.

SC Okay, good. Okay, we've got just about all we're going to get out of the tank. Now, Al will back it up and we'll show you how the other set of baffles work. And you'll note, the baffles not only aid on the fluid coming into the tank, but also it makes for nice orderly discharge on the other tank. Now you can see it coming into this tank with here again, surface tension on the sidewalls and the 2 baffles and proceeding to fill the tank.

CAPCOM That's very clear, Stu. You might run it back once more.

SC Okay, we'll give it to you again.

SC And I don't know if you can see it or not Gordon, but when a bubble does come into the tank, it's

SC broken up by the baffles and tends to hang in pretty well. There, we just saw one burst there, if you happened to notice that.

CAPCOM Hey, we can see that very clearly.

SC Why don't you run it fast and show the slosh if you can get it that fast.

SC Okay, we're going to increase the rate of flow on this one.

CAPCOM Okay.

SC Okay, now with the faster flow rate, you don't quite have time for the bubbles to dissipate using the baffles and we did pick up a few more bubbles. Gordon, to really appreciate this you have to try -

END OF TAPE

SC - - you're in a - to appreciate this you had to have tried the other side. I'm afraid that one didn't show up too well, because all we had was the two bubbles in the center, but we can prove to you that the pump was working, because it works on this side. But it - it was just impossible to transfer any fluid after we opened the valve the first time, it got fluid out of one tank into the other one.

CAPCOM I think that's clear, Stu, now that we see how well this side works. We can see that the - without the baffles it's a pretty hopeless situation.

SC Rog.

SC Okay, Gordon. That's probably about enough of liquid transfer. And I think we pretty well covered the four experiments unless you've got some questions, that I didn't make clear or that has come up during the presentation.

CAPCOM One quick question. Did you have - Have you tried the - on the heat flow convection experiment the flow pattern part of it where you expected to see Bernard cells, did that work out?

SC Yes. We tried that, Gordon, and it didn't work out too good. Maybe while we've got the TV here, we'll talk about that one and maybe you can get some help and we'd like to try running it again. We ran everything except the benard cells and Ed, could you put the camera back over on the convection experiment, Ed.

SC What has been happening here in this particular experiment, we have a krytox fluid that's suppose to come out at three different locations along the base of this cup. Can you see that cup from your view?

CAPCOM Yes. We're getting a very good view of it.

SC This is the outline of the cup right here. That's three very small holes down at the base of the cup at its periphery and Krytox fluid flows in when we work a little hand pump here. And it's suppose to spread evenly over the bottom of this cup, which it does under 1g. The cup is a heating element and we - we're going to study the rate of growth of the size of growth of the Bernard cells in the Krytox fluid. Unfortunately, we're not sure whether we have air in the fluid, too much air in the fluid or not, but we're attempting to get the fluid to flow on the base of the cup but under the circumstances, we find that we don't have any luck and rather it comes up along the walls of the cup adjacent to all three of the holes. And if you have any experts down there, we'd like to talk about that a minute.

CAPCOM Have you tried to use an object to move - to try force the fluid to spread on over the surface by opening the lid on it and then trying to force it

CAPCOM spread out evenly.

SC You mean physically spreading the Krytox around, Gordon?

CAPCOM That's - that's right. That's the question. We wondered if you tried that yet?

SC No. We didn't, you know, our instructions there said if it didn't adhere to the surface we were to close up the lid and go home. We tried it three times and that amplify there, it comes out of the hole, comes up the wall and then spreads between the holes right on around the wall. It just keeps packing up. We - we're most anxious to try it again and we'll turn her on and try spreading it across there.

CAPCOM Okay, Stu. We don't intend to ask you to try all this on TV, but our only suggestion would be to maybe open it up and try to spread it across with your finger or with a tissue or something like that, but that seems to be the only idea to be offered.

SC Okay. Well, if you've got the time, we'll turn on the Krytox here and let you watch it come out.

CAPCOM Okay. We're - be glad to watch.

SC What I'm doing here is opening a flow valve between the tank and Krytox and the liquid plate. And over here we have a pump, which is actually when I turn it in a clockwise direction. Perhaps you can already see that we have fluid coming out right here. It's staying right here in this crevice moving up the side walls. Can you see that on the camera?

CAPCOM Yes. We can see that very clearly.

SC See, it's doing it almost the same all the way around it. This is when it's spreading a little further down the line, doesn't have quite as much fluid, yet, but these two are spreading the same way. They're going up the walls as much as they are coming out on the floor. Now we'll get a finger in here and see what happens.

SC I believe we may be able to get enough there to show you the formation of these Bernard cells.

CAPCOM Okay.

SC We have a thin layer here now. Let's turn on some heat and see what happens.

CAPCOM Okay.

CAPCOM Ed, the comments - the camera man there - we noticed a real improvement in the picture just about a minute or two ago. If you did anything different there remember what you did for future use.

SC We just put it back on average from the peak we had it on a little while ago.

CAPCOM Rog.

SC Yes. We can see some action here probably in a couple of minutes, Gordon, when these form -

SC - I think you saw them down at the Cape, didn't you Gordon?

CAPCOM No. I didn't see those personally.

SC Okay. They're pretty impressive and it breaks into the Bernard cell here.

SC I think we're having the formation of some small cells, of course - -

END OF TAPE

SC The small cells. The film we've put out here so far is fairly thin. It's difficult to get the vertical circular pattern set up.

CAPCOM Roger.

CAPCOM Stu, the experts here would like to pass along the fact that it should take longer to get the cell formation with a thin layer fluid than with a thick layer.

SC Yes, we have a peculiar pattern in this fluid, which you probably can't see, but the fluid which I put in the center stayed there but there's a very thin layer here indicating that it's gone out radially again and as you can see we have some pretty good size fillants that stay right on the outside of the cup, very much the same principle as the circuit station that you saw in the experiment of the tank without the baffles.

CAPCOM Roger, Al.

SC Well the cells are forming. You can see small cells. You probably can't pick them up with the camera because the cells are only approximately a sixteenth of an inch in diameter right now. I think, yeah, if you hold on just a minute we're going to see some pretty spectacular formation. They're starting to form right now and get a little bit larger.

CAPCOM Okay.

SC Gordon, are you able to see the detail of the cells?

CAPCOM Not really now, Ed. We see some texture there in the fluid but it's hard to say that they're really cells from here.

SC I think you'll be able to see them distinctly in a minute. They're starting to get larger and more active.

CAPCOM Okay now I, now we're seeing the cells pretty well. They're becoming much more apparent now.

SC Improved common techniques again.

CAPCOM Al do you recall how many total turns you've put on the knob that pumps the Krytox out there, they are curious just what total quantity is in the cup at this time.

SC Well, we have about 2 turns full right now.

CAPCOM Roger.

SC Well, we do have some tiny cells here, and we'll play with this one before we photograph it. In the meantime you all might be thinking about that.

CAPCOM Roger, Al.

SC But we can definitely see these formation of the same type of cells, although they're smaller than we had down there. If we had some more fluid in there we could get larger cells.

CAPCOM Roger.

SC And Gordon, after the TV here, we'll put the camera back up and take a picture of what we've got here, just while it's there.

CAPCOM Roger.

SC Okay, I guess that's about all of it from our zero-g lab on Apollo 14. I think we're real pleased with the experiments, and I want to compliment all of the PI's on the work that they did. They came out extremely well, they went just as advertised on the procedures, gave us no trouble and they've been real enjoyable to work with and hopefully, this is the beginning of bigger and better things in the way of manufacturing processes and so forth in space, and I believe Al has got some words here.

SHEPARD I just wanted to say a couple of words before we signed off tonight. What we've been talking about among the three of us when we were setting up these experiments, is the contribution this can make immediately and directly into American lives and the lives of people around the world. For example, if specifically, these manufacturies and processes of metal turned out to be better in the space environment, or the vaccines which are proposed to be developed in weightless condition can be used effectively and immediately and certainly this type of an operation in Skylab of the future can become immediately beneficial to the peoples United States and the peoples of the world. As a matter of fact, one of the things we're talking about, and in connection with tremendous achievements of the space program so far that have contributed particularly in the field of communication. For example right now, I'm sure this broadcast is going directly over seas to millions of people who are seeing it in their homes through satellite, and I think many people have said that this improvement in communication through the space satellite will certainly go a long way in solving the problems of the world. Problems of understanding between peoples of different nations and different countries. We are reminded however, as we look at that shimmering crescent, tonight, which is the earth on our way back that there still is fighting going on, the three of us all have acquaintences, friends, and even relatives in Viet Nam, we are reminded that some of the people, some of the men who have gone to Viet Nam have not returned, that are still being held there listed as missing in action or as prisoners of war and it is our wish tonight that we can in some way, contribute through our efforts to the space program to promote a better understanding of peace throughout the world and help to rectify these situations which still exists, and with that thought, for Ed, and Stu, and myself, I will say good night to you from Apollo 14.

CAPCOM Roger, Apollo 14, thank you very much for the interesting and - thank you very much for the whole show, we've enjoyed every minute. Good night.

SPEAKER Inspiring was the word that Gordon was looking for.

SC Okay, thank you.

END OF TAPE

PAO This is Apollo Control 173 hours 25 minutes ground elapsed time. The distance from earth now 161 112 nautical miles, velocity 3893 feet per second. Inflight demonstrations complete as recently televised. The crew of Apollo 14 now has gone back to the start of program 23, cislunar navigation exercises using the spacecraft optics or navigation sextant taking sightings and measurements on several selected stars in the Apollo navigation star list, measuring the included angle between the stars and the earth far horizon as seen from 161 miles out. Still up and live on air-ground. This is Apollo Control at 173 26

CAPCOM Apollo 14, Houston.

SC Go ahead.

CAPCOM The only suggestion we can make on that problem of the Bernard cell flow pattern experiment there is that that rubber surface around the edge of the cup is supposed to be treated so that the fluid won't adhere to it. Obviously it's not working. The only suggestion that might work would be to take a tissue and wipe that off real well and try to clean it as well as possible and then try to put as thick a layer as possible of krytox into the cup with your finger if necessary and the thicker the better, evidently, for results - more visible results. And a question for all the experiments. We'd like a status on just where you stand as far as taking data and if on each of the 4, if you could give that to us, the support people would like to know. Also, if you intend to work on it tomorrow, they'll be here to answer any questions or whether you're going to finish it all up tonight. Over.

SC I don't think we'll be able to get it all completed tonight, Gordo. However, if you give us a call when they're leaving, then we'll be able to tell you what the completion factor is.

CAPCOM Okay, actualllly, they'll all stand by as long as you wish. If you give us just a status right now, I think that's what they want. Have you taken any data on the -

SC Okay, well as far as -

CAPCOM - on the electrophoresis yet, for instance.

SC Well, let's start with the metal composites, as far as that's concerned, we had no problems with that and we have completed, I think, 3 or 4 of those and we will press right on with those all the way in. As far as the Heat Flow is concerned, we have completed with the zone and the radial flows and we'll try one more time on the krytox. We, I think, only did this film on the fluid transfer. We have no questions on that so no further support on that will be required. And we have not made an attempt on the electrophoresis yet. We're using that for demonstration for television only. That's the only one that we would really need any support on at all.

CAPCOM Okay, fine. I think that answers their question.

SC We should be getting into the electrophoresis after we finish this next P23.

CAPCOM Okay, thank you, Al.

SC Houston, 14.

CAPCOM Go ahead.

SC Gordon, is anybody concerned about a little longer delay in going into PTC. I was looking ahead at these 3 constraint stars. We could cut those out - I'm not suggesting it, but if we're concerned about the thermal aspect.

CAPCOM Stand by. We'll check on that.

CAPCOM Stu, we don't see, immediately anyway, any particular rush to get into PTC so go ahead and complete the P23 as shown and if we come up with something we'll call you later. That's something that requires us to get into the PTC sooner. I don't think there's going to be anything though. Over.

SC Okay, I just wanted to check with you. We've been out awhile.

END OF TAPE

CAPCOM Apollo 14. Apollo 14, Houston. Over.

SC Go ahead, Houston.

CAPCOM Okay tank 3 heater is getting up above the limit. It's 335 and climbing. We'd like to have you turn tank 3 OFF and 1 and 2 to AUTO. That's the O2 heater.

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

CAPCOM Thank you.

SC You got it.

CAPCOM Antares, Houston. We think that you loaded 35 Rasalhague when you meant to load 33 Antares there. Over.

SC Rog. Gordon, I copied that.

SC Okay. You're so right. I'm seeing double here.

CAPCOM Big brother is watching.

SC And calm.

PAO This is Apollo Control. 174 15 ground elapsed time. Spacecraft to earth distance now 159 215 nautical miles, velocity 3933 feet per second. Apollo 14 crew still at this time engaged in program 23 Cislunar Navigation Exercises. And shortly we'll be setting up PTC for the night - passive thermal control. Eat dinner and go into a ten hour rest period. We'll leave the circuit up till such time as they sign off for the night and go into that rest period at 174 15 ground elapsed time, this is Apollo Control.

CAPCOM Stu, this is Houston.

SC Go ahead.

CAPCOM Stu we've noticed - at least it looked like it to us here that you took six marks on star number 5 rather than 3 on 5 and then 3 on six. Probably have to do six over. Over.

SC Say that again, Gordon.

CAPCOM One of the backroom guys that was watching said that you did six marks on number 5 rather than three on five and three on six. Is that the way it seemed to you?

SC Okay, I'll do six.

SC He knew six would be a difficult star so he practicing extra on 5.

SC Hey Gordon. The tough one is that number 3. I don't know why - that's a tough star.

CAPCOM And we get it.

CAPCOM Al, this is Houston.

SC Go ahead, Houston.

CAPCOM For EECOM we noticed one on the last heater cycle on O2 tank 3 that the temperature went up pretty fast. We'd just like to verify that the 50 watt

CAPCOM heater breaker is out. That's on panel 226. That's on tank 3.

SC You want to go to tank 3.

CAPCOM As you would like to know where it was when you look at it - we think it was out. We'd like to verify that and we'd like you to leave it out if it is out.

SC The breaker was in - it's now out and we'll take a look at our flight plan and see where that was suppose to happen.

CAPCOM Okay Al. I think it was a realtime read-out. It wasn't on my shift but that's indication i get right now that it was a real time read up to you from the DTO.

SC Okay. We must have missed it. Sorry.

CAPCOM No problem.

END OF TAPE

CAPCOM Apollo 14, Houston, over.

SC Go ahead.

CAPCOM Al, we have a fairly lengthy procedure for stowing the probe for entry. We thought it might be a good idea to try to summarize it quickly to you now so that you can think about it somewhat. We're picking out a time tomorrow to accomplish this. We think that it should be no problem to finish it in about an hour and it looks like maybe the crew exercise period scheduled at 190 hours might be a good time, so what we'd like to do is get Stu on the horn and summarize the whole procedure. Just quickly so you can think about it, and then when it comes - when you get ready to do it, rather than - it would take as long to write down all these directions as it would to do the stowage, so we could just real time read the steps to you one at a time as you accomplish it, and it may be easier than trying to copy it all down. Over.

SC Okay, it sounds fine. As a matter of fact we're discussing that a few minutes ago. If you'll hold on just a sec we'll put Stu on the air.

CAPCOM Okay.

SC Houston, 14.

CAPCOM Roger, this is Houston.

SC Rog, I think we're all on the air.

CAPCOM Okay, Stu. I'm not intending for you to either write this all down, or to remember it all. We'd just like to give it to you once through quickly, so you can think about it and we'll do it in detail tomorrow, when we get around to doing it for real. The first thing, is the stowage for the decontamination bags that ordinarly go on A10 and A13. Then they want to modify that to stow the one that has 30 pounds in it, and put that one on A13, using the existing tie down rings. But the one that has 20 pounds rather than putting it on A10, we want to put it on A8, and use the D rings on A8 in essentially the same manner, the normal manner of strapping it down. On top of that one, we want to take the CMP suit and helmet and put it in a sleeping bag and then use the LM webbing and lash it down on top of the 20 pound decontamination bag on A8, and this should, all tie down there to allow a minimum 4 inch clearance for the couch for couch stroking. Are you with me so far?

SC Rog.

CAPCOM Okay, now for the probe storrage. We start by going through A10, and remove anything you think you might need later. We can't identify anything in there that will be needed later but you want to take a check, because once we get the probe lash down on top of that, it will be pretty tough to get back in there. Then go to A5 and remove the head rest pads and put them on the couches. Take

CAPCOM the heel clips and ropes, there should be 5 ropes in there and stow them temporarily. From the right hand side of A5, take the cushion and all the equipment that's in that cushion and put it in food box B1, and from A6, take the 2 LIOH cans from A6 and put them in the left hand side of A5. Take the TV equipment that's in A6, wrap the TV monitor in a constant wear garmet and put all of the Tv equipment into B1 also. Okay, now take the ropes, take 1 of the ropes that you removed from A5 and double it, and then tie it to footpad on A6, the footpad that's in the corner, it'd be the plus y, plus Z foot pad on A6, and take 3 other ropes and tie 1 end of each of those 3 ropes, we won't double those ropes, tie 1 end of each of those 3 to the same point, that being the other foot pad near the wall on A6, it'd be the plus y minus z foot pad. Okay, now we go to the probe and take 2 flight data file books and tape them to the base end of the probe, the end with the capture latch release handle. The probe now will be placed with 1 of the pitch arms, those are the large arms that normally contact the face of the drogue, one of those pitch arms down toward the aft bulk head between A6 and A10. The apex of the probe pointing in the minus y direction and the base end of the probe with the flight data file books taped on them touching the right hand equipment bay. Is that clear more or less the position that it'll be stowed in? Over.

SC Yea, it's real clear Gordon. You're doing a great job.

CAPCOM Okay, then there'll be 6 points that the probe will be resting on. I won't go into all of those but will identify those as we go, and determine where, with a pencil or something, mark where these points are, and remove the probe from that location, and on 3 of those positions we'll have to shim them up. One of these contact points will be shimmed with a sleeping bag on top of which we'll put one of the rendezvous window shades and on top of that a flight data file book. One of the other contact points will be shimmed with a flight data book and the third point will probably take a couple of flight data books to fill up the gap. Once we get the shims in place, we'll put the probe back down, and check that all 6 contact points are indeed making contact, and then we go through a fairly, on about 5 steps of rope tieing. I won't go into the details, but we've got it all figured out where each rope coming from the A6 foot pads goes to on the probe and then back down to various other places, essentially lashing the whole thing down between points on A6 and A10. And as a final step, using tools that we've got for you from the tool kit, tools that we have identified, we'll take apart one of the suport arms, will remove the bolt that holds that support arm to the shock strut, and then tie the loose support arm to the probe with the last rope

CAPCOM to keep it from flopping around. This takes that support arm out of the couch stroke envelope. And that'll do it. How's that, clear as mud?

SC No, that's pretty clear, Gordon. When we got to that part about all the rope tieing, you know I thought I sure am glad I'm flying with 2 sailors, you know they can handle that no sweat.

SC That's what you call abundantly clear. It sounds like you've put a lot of effort in to that one.

SC I was just wondering how many new hires it took to figure all that out in 2 days.

CAPCOM That has a few man hours spent on it. What I intend to do is go over tomorrow and do it all myself in the mock up, and then I'll probably sub Bruce sometime, if we end up at that same time in the shift tomorrow that we suggested around 195 hours I'll be back here filling in anyway and I can go through the gory details with you as you do it, if that sounds good to you.

SC That's great Gordon. We sure appreciate all the effort you're going through here and it's -

END OF TAPE

SC - - Gordon. We sure appreciate all the efforts you're going to here and it sounds like you've got it well in hand then. That was pretty clear. Real clear the first time through and will you giving us the details, it shouldn't be any sweat. In fact, I bet we could hack it right now.

CAPCOM Okay. Very good.

CAPCOM 14, Houston.

SC Go ahead.

CAPCOM Would you verify that you did change the lithium hydroxide canisters called for at 174 hours.

SC Naturally.

SC Absolutely.

CAPCOM Okay.

CAPCOM Apollo 14, Houston.

SC Go ahead.

CAPCOM If you're all finished with your overboard dumps up there your rates look good for starting the spin up and we would like you to configure the high gain in the - coast to sleep mode as shown in the systems checklist. We'd like you to use option one under that, which is with the high gain operation as shown there rather than OMNI operation. We want to watch the high gain awhile and then before you go to sleep we'll try to go back to OMNI. Over.

SC Okay, Gordon. Fine. I'll bring it up that way.

SC Okay. We'll spin up with V2, D2.

CAPCOM Roger.

PAO This is Apollo Control at 176 hours, 18 minutes ground elapsed time. Apollo 14 now 154, 455 nautical miles out from earth approaching at a velocity of 4, 037 feet per second. The crew of Apollo 14 apparently preparing for the 10 hour sleep period and there having been no communications from the crew in the last several minutes, we will take the circuit down at this time and play back on a delayed basis any subsequent conversation prior to sleep, if there is any. At 176:19 ground elapsed time, this is Apollo Control.

END OF TAPE

PAO This is Apollo Control 176:46 ground elapsed time. Spacecraft communicator Gordon Fullerton is giving the crew their last go to bed instructions on the communications, which antenna to use, and so on. And, we've accumulated short amount of tape, and we'll catch up live here. Let's roll the tape.

CAPCOM (garbled) any time you are. We'd like you to secure the high gain in pitch minus 52 and yaw 270 and manual on wide, and then the other switches as shown on the checklist. Over.

SC Okay. Will do that, thank you.

CAPCOM Roger.

CAPCOM Sounds like you're having a party up there.

SC That's the only ingredients we have for a party, though.

CAPCOM Roger.

CAPCOM Apollo 14, Houston. EECOM has informed us that unless we get these onboard readouts before you go to sleep we're going to have to return to Earth as soon as possible.

SC All right.

SC Well, if we thought it would have helped we'd just be quiet.

SC Houston, Apollo 14.

CAPCOM Go ahead, 14.

SC Okay, Gordon. The onboard readout follows bat C 37 volts, pyro bat A 37.3, pyro bat uc 37.3, RCS A 58 B 55 C 57 D go and standby for the rest of it.

CAPCOM Houston.

SC 14. We have no medication to report. The crew is doing fine.

CAPCOM Okay, Ed. Thank you.

END OF TAPE

CAPCOM Apollo 14, Houston, over.

SC Go ahead, Houston.

CAPCOM We're at a good angle now for an E MOD dump, if you'd like to give it to us.

SC Okay.

CAPCOM And that about completes all the things that we had to pass up before you go to sleep. We want you to finish the rest of the presleep check list and wish you a good night.

SC Okay, here it comes and good night to you.

SC Did you get my last (garble)

CAPCOM Negative, say again, Ed.

SC Okay, the E MOD dump is on the way and good night to you.

CAPCOM You planning to raise the cabin pressure now, or wait a while?

SC Oh, we'll wait a while, we're not quite ready to go to sleep, yet.

CAPCOM Okay, Ed.

END OF TAPE

PAO This is Apollo Control. Apollo 14 now established in a barbeque roll, passive thermal control mode. They reported that the crew is in fine shape; no medication has been taken today. Gave their onboard readouts and battery voltage readings and quantities remaining in the service module reaction control system propellant tanks. And it isn't likely that they'll call back to control center again tonight before going to bed. So at 177 hours 22 minutes ground elapsed time, this is Apollo Control.

END OF TAPE

APOLLO 14 MISSION COMMENTARY, 2/8/71, 0:35 CST, 178:12 GET, 536/1

PAO This is Apollo Control 178 hours 12 minutes ground elapsed time. The crew apparently asleep at this time. The spacecraft distance from the earth 149 950 nautical miles, velocity 4138 feet per second. Spacecraft weight 24 559 pounds. First indication here on the present trajectory for a time of entry interface are 400 000 feet. This time will fluctuate in the next two days as we get nearer to entry but the initial time shown here in the space digitals computation display shows that time to be 216 hours 27 minutes 31 seconds. Entry velocity 36 170 feet per second, at an entry angle of minus 6.63 degrees. But as mentioned before these numbers will all shift back and forth especially after any further midcourse corrections. Rather quiet here in the control room. Members of Pete Frank's Orange Team of flight controllers are beginning to drift in, takeover console for a shift handover less than an hour from now. And at 178 hours 13 minutes ground elapsed time, this is Apollo Control.

END OF TAPE

APOLLO 14 MISSION COMMENTARY, 2/8/71 179:12 GET 537/1

PAO This is Apollo Control, Houston at 179 hours 12 minutes ground elapsed time. The crew of Apollo 14 are presently in a rest period. Meanwhile, in Mission Control we've had a hand over of flight control teams. The Orange Team headed by Flight Director Pete Frank now on board. Our Capsule Communicator for this shift is Apollo 13 astronaut Fred Haise. Realistically, we do not expect Haise to have verbal contact with the crew, but he will be in a stand by mode throughout the morning. And, momentarily Flight Director Pete Frank will be going around the room posting each of his consoles as to our status. And at 179 hours 13 minutes, this is Apollo Control Houston.

PAO Apollo Control, Houston. Ground elapsed time 179 hours 14 minutes. Apollo 14 is presently 147 447 nautical miles away from Earth, and traveling at a velocity of 4197 feet per second. This is Apollo Control Houston.

END OF TAPE

APOLLO 14 MISSION COMMENTARY 2/8/71 180:12 G.E.T. 538/1

PAO This is Apollo Control Houston at 180 hours 12 minutes ground elapsed time. Our displays in Mission Control presently show Apollo 14 at a distance of 145 076 nautical miles away from the earth and traveling at a velocity of 4 253 feet per second. Meanwhile in the Mission Control Center, relative quiet, it could be described as a quiet business-like atmosphere, very little conversation going on over the flight director's loop. However, over the past hour flight director Pete Frank has been talking to his recovery support room, receiving an update on our end of mission status. The prime recovery vessel, the New Orleans, is presently at a position of 22 degrees 40 minutes south, 171 degrees 20 minutes west. This places the vessel approximately 5 degrees north, at the present time, of the prime landing area. The present end of mission coordinates that we're reading out are 27 degrees 2 minutes south, 172 degrees 37 minutes west. The end of mission weather forecast at this time appears quite favorable, showing a cloud coverage of 2 000 feet scattered, broken. Visibility 10 miles, winds 12 knots from 100 degrees, wave heights 4 feet. We're at 180 hours 14 minutes, continuing to monitor, this is Apollo Control Houston.

END OF TAPE

APOLLO 14 MISSION COMMENTARY 2/8/71 3:35CST 181:12GET MC-539/1

PAO This is Apollo Control Houston at 181 hours and 12 minutes ground elapsed time. We presently show Apollo 14 at a distance of 142 587 nautical miles away from the Earth. And traveling at a speed of 4314 feet per second. The crew of Apollo 14 continues in their rest - in it's rest period. We've had no contact with the crew during the past hour. Our capsule communicator, Fred Haise, has been engaged in quiet discussions with flight director, Pete Frank, on various aspects of the mission, the more active parts of the mission. Meanwhile, we do show that we will reach that point in time where the velocities relative to the Earth and Moon will match. This should occur at ground elapsed time of 182 hours 3 minutes. And that matching velocity should read 4370 feet per second. We're at 181 hours 13 minutes ground elapsed time and this is Apollo Control Houston.

END OF TAPE

APOLLO 14 MISSION COMMENTARY, 2/8/71, 4:35 CST, 182:12 GET, 540/1

PAO This is Apollo Control, Houston, at 182 hours 12 minutes ground elapsed time. We now show Apollo 14 at a distance of 140 059 nautical miles away from the Earth travelling at a velocity of 4377 feet per second. Meanwhile, in the Mission Control Center our wakeup clock has started to countdown. We show 3 hours 47 minutes from time of waking up the crew of Apollo 14. Other activity is quite subdued. Members of our flight control team are presently watching a replay of last night's television transmission now being displayed on one of the large screens in the Mission Control Center. We're at 182 hours 13 minutes ground elapsed time and this is Apollo Control, Houston.

END OF TAPE

APOLLO 14 MISSION COMMENTARY, 2/8/71 183:12 GET 541/1

PAO This is Apollo Control, Houston at 183 hours 12 minutes ground elapsed time. Apollo 14 now at a distance of 137 506 nautical miles away from Earth, traveling at a velocity of now of 442 feet per second. Apollo 14 passed its' half way point in time 2 minutes ago. This being the time from transearth injection burn shutdown to entry. Our clock at this reference point showed Apollo 14 at a ground elapsed time of 133 hours 10 minutes, a distance away from Earth at 137 591 nautical miles, and a velocity relative to Earth 4440 feet per second. Our wakeup clock in Mission Control shows that we have 2 hours 46 minutes before the crew of Apollo 14, Al Shepard, Stu Roosa, and Ed Mitchell are awakened. At 183 hours 14 minutes, this is Apollo Control Houston.

END OF TAPE

APOLLO 14 MISSION COMMENTARY, 2/8/71, 5:46 CST, 183:23 GET, 542/1

PAO This is Apollo Control, Houston, at 183 hours 23 minutes now ground elapsed time. Apollo 14 presently 137 033 nautical miles away from Earth. And traveling at a speed of 4454 feet per second. We have a correction to make to our previous announcement that halfway point in time at time from TEI shutdown to entry was reached at 183 hours 10 minutes ground elapsed time rather than 133 hours 10 minutes as previously reported. We're at 183 hours 24 minutes and this is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control Houston at 184 hours 12 minutes ground elapsed time. Apollo 14 is now 134 907 nautical miles away from Earth, velocity now reading 4510 feet per second. The crew continuing in their rest period. Our clock at Mission Control showing now 1 hour 47 minutes until time of wakeup. At present the requirement for a midcourse correction six appears to be not a strong one, and the possibility of this maneuver at this time appears unlikely. We would presently show midcourse correction six is performed at a ground elapse time of a 194 hours 23 minutes, and with a Delta-V of .9 feet per second. We're at 184 hours 13 minutes ground elapsed time, and this is Apollo Control Houston.

END OF TAPE

APOLLO 14 MISSION COMMENTARY,2/8/71,0735 CST, 185:12 GET,MC544/1

PAO This is Apollo Control Houston at 185 hours 12 minutes ground elapsed time. Our digital displays presently show Apollo 14 at a distance of 132 261 nautical miles away from the earth. And they're traveling at a speed of 4580 feet per second. It's 47 minutes until the scheduled time for crew wake up. Apollo 13 astronaut Fred Haise is our Capsule Communicator. We presently show the spacecraft weight of 24 559 pounds, all systems aboard Apollo 14 have been performing as advertised. All aspects of the return flight thus far look very good. We're at 185 hours 13 minutes ground elapsed time and this is Apollo Control Houston.

END OF TAPE

PAO This is Apollo Control Houston. 185 hours 59 minutes ground elapsed time. We presently show Apollo 14 at a distance of 130 166 nautical miles away from earth, traveling at a speed of 4637 feet per second. In the mission control center CAPCOM Fred Haise should be placing a wake-up call to the Apollo 14 crew shortly. We'll keep our line open and continue to await that call. At 185 hours 59 minutes, this is Apollo Control Houston, standing by.

END OF TAPE

CAPCOM Apollo 14, Houston.

PAO Apollo Control Houston. 186 hours, 3 minutes ground elapsed time. Apollo 14 now 129,959 nautical miles out from Earth. The present velocity shows 4643 feet per second. Standing by this is Apollo Control, Houston.

CAPCOM Come on in Apollo 14, Houston.

PAO That's Fred Haise placing that call.

SC Apollo 14, go ahead, Fredo.

PAO And Ed Mitchell responding.

CAPCOM It's pretty chilly down here. How's it up there?

SC Oh, very comfortable. 71 degrees in the cabin. What do you mean by chilly? Is it freezing?

CAPCOM Al, let's see this little report I've got here. It says that it's supposed to go down to 28 degrees.

SC Man, have you moved Houston to the North Pole already?

CAPCOM Yeah. There's also a pretty good breeze blowing which doesn't help.

SC Got the old chill factor down a little bit, huh?

CAPCOM Yeah.

SC Better hold on a minute. Let me see if I can wake the rest of these guys up.

CAPCOM Okay.

CAPCOM Apollo 14 now 129,777 nautical miles out from Earth, at a ground elapsed time of 186 hours, 8 minutes.

SC Now there's some grumbling going on over here about getting up, Fred, but I think they'll be around in a minute.

CAPCOM Okay. I suggest that maybe we let you keep your bankers hours but the flight brought up the point that tomorrow morning you can't afford to sleep in late so if you're going to get the job done and get back in so we've got to get you back on schedule today.

SC Okay. Very good. I'll get some of these chores done and I'll be back with you in a few minutes, Fredo.

CAPCOM Okay.

PAO We're standing by for further communications with the crew of Apollo 14. Ed Mitchell responded apparently Al Shepard, Stu Roosa still asleep but they should be awake very shortly. We're at 186 hours, 10 minutes ground elapsed time and Apollo 14 at a distance of 129,669 nautical miles away from the Earth, velocity 4651 feet per second. This is Apollo Control, Houston.

END OF TAPE

CAPCOM Apollo 14, Houston.

SC Houston, 14. Go ahead.

CAPCOM 14, Houston. I wonder if you could verify, Ed, that the tank 3, 50-watt heater breaker on 226 is OPEN.

SC Fredo, (garble)

CAPCOM Okay.

END OF TAPE

PAO Apollo Control Houston 186 hours 28 minutes ground elapsed time. Looking at our displays, we see that Apollo 14 has started computer program number 52. This is a platform alignment. Apparently the crew already started some of the early aspects of today's flight plan. We're at 186 hours 29 minutes and we show Apollo 14 at a distance of 128 821 nautical miles at a velocity of 4675 feet per second. Apollo Control Houston.

CAPCOM How do you read now, Ed?

SC Loud and clear, Fredo.

CAPCOM Okay, since we got that tank 3 back in the line, we just wanted to verify that the tank three, 50 watt heater breaker on 226 is still open.

SC That's verified, it's still open.

CAPCOM Very good.

SC It's still a mystery as to how it got closed yesterday.

CAPCOM You've just got nimble toes maybe.

SC This is quite possible.

CAPCOM And we have the noun 93s.

SC Houston, 14.

CAPCOM Go ahead 14.

SC Fredo, let me give you our post sleep report.

CAPCOM Okay.

SC Okay, we each had four hours sleep, PRD for Al is 16059. PRD for Ed, 07057 and Stu didn't have one, it's broken.

CAPCOM Okay, we copy.

END OF TAPE

APOLLO 14 MISSION COMMENTARY 2/8/71 0919CST 186:56GET MC549/1

PAO This is Apollo Control Houston. 186 hours 59 minutes ground elapsed time. We've had no conversation with the crew of Apollo 14 for awhile, very possibly the crew having their morning meal. We're now showing Apollo 14 at a distance of 127 459 nautical miles, and traveling at a speed of 4713 feet per second. Standing by, continuing to monitor, this is Apollo Control Houston.

SC Houston, 14.

CAPCOM Go ahead 14.

SC I've been giving you a confounded medical report every day, how's your pulse this morning?

CAPCOM Pretty slow about right now Ed.

SC Okay, you're alive and well and no medication, huh.

SC Yea, I'm on a different flight plan than you are. I'm just fixing to get to my sleep period.

SC I see, okay.

END OF TAPE

PAO That was Fred Haise responding to Ed Mitchell's comment. Fred Haise has served as the CAPCOM on the orange shift team of flight controllers. We're in the process of having a handover at Mission Control. With the maroon team headed by Flight Director Milt Windler, coming aboard. We're at 187 hours ground elapsed time and this is Apollo Control, Houston.

CAPCOM 14, Houston.

SC Go ahead Fredo.

CAPCOM Okay, Al I wonder if you could set your two high gain knobs to PITCH minus 40, and YAW 90.

SC That's 40, 90. You have it.

CAPCOM Okay. And, Ed, I wonder if we can get you to put the switch to NARROW and REACT.

SC NARROW and REACT, you have it.

CAPCOM Roger. Okay, and Ed we're just going to sit here a little while. And they want to look at it and make sure it doesn't drift off before we proceed any further.

SC Okay.

SC Houston, Apollo 14.

CAPCOM Go ahead, 14.

SC Fred let me have a copy of the comsumables update.

CAPCOM Okay. It's GET of 186 hours. Your RCS total - standby one. Okay, Ed, RCS total 46.2, QUAD A 47.0, B, 43.7, C 47.1 and DELTA 46.9. H2 tanks 138.1, 236.9, O2 tank 167.0 and number 2 68.6 and number 3 is 15.2.

SC Okay. Readback at GET 18600, RCS total 46.2, QUADS 47.0, 43.7, 47.1, 46.9. Hydrogen 38.1, 36.9, oxygen 67.0 68.6, 50.2.

CAPCOM Okay. Good readback.

CAPCOM 14, Houston.

SC Go ahead Fredo.

CAPCOM Okay, looks like that high gain has drifted would you select MANUAL and when it's back to your preset knob settings there go back to REACT for us and then select high gain and we'll command it done.

SC Got that.

SC Okay, have you got it.

CAPCOM Okay it.

SC GARBLE.

END OF TAPE

PAO This is Apollo Control at 187 hours 34 minutes. Our shift change has been completed in Mission Control. Flight director on this shift is Milton Windler, and the capsule communicator is astronaut Bruce McCandless. Apollo 14 at this time is 125 865 nautical miles from Earth. The spacecraft velocity, 4760 feet per second.

SC Houston, 14.

CAPCOM 14, this is Houston. Over.

SC Good morning, Bruce. The EMF entry check passed okay.

CAPCOM Very good, Stu.

CAPCOM 14, this is Houston. Over.

SC Go ahead, Houston.

CAPCOM If you could give us a status report on the progress of the inflight memos, especially any that you consider that you've completed, we can release some of the supporting personnel. Over.

SC Okay. I guess we need to talk about that we completed the heat flow and convection experiment all the way, never did really get too many good results on our bernard cells, but we got some - we finished the - essentially we're finished with all the inflight experiments with the exception of the metal composites and we're pressing along through those. And I guess we - we don't require any more support.

CAPCOM Okay. Thank you, 14.

CAPCOM Apollo 14, this is Houston. Over.

SC Go ahead Houston, 14.

CAPCOM 14, our current feeling is that midcourse correction number 6 will probably not be required, however, we'll give you a definite decision on that later on as we get a little bit more tracking. And we have a procedure for further investigation into the light flash phenomena which we'd like to get your feelings on. If we don't burn midcourse 6, we're looking at scheduling a period of something on the order of an hour starting at about 193 45 or 193 50 for this light flash investigation and we're wondering how that fits into your onboard schedule. Over.

SC Stand by one. Okay, Bruce, if we do skip midcourse 6, why that will be all right. We'll take that time for the light flash.

CAPCOM Roger, Stu. Out.

END OF TAPE

PAO This is Apollo Control at 188 hours 5 minutes. Apollo 14 at this time 124 404 nautical miles from earth, and spacecraft velocity up to 4800 feet per second. Primary activities for the crew today will be, a series of star sighting navigation checks that they'll be running with their onboard guidance system, using the onboard sextant to sight and mark on selective stars. This information is integrated by the computer to update the guidance system's knowledge of the spacecraft's position and velocity, and is used as a back-up to the ground computed numbers for midcourse corrections and for entry. Also today, the crew will be stowing the probe assembly which was brought back for engineering analysis. They'll begin stowing the probe at about one hundred and ninety hours and the flight activities officer estimate that this will require about an hours time. The crew is also scheduled to hold a televised press conference from the spacecraft at 195 hours 7 minutes, which is 5:30 p.m. Central Standard time. They also reported that they have virtually finished the in-flight demonstrations, I believe Stu Roosa said they had finished with all but the metal composites.

END OF TAPE

CAPCOM Apollo 14, this is Houston, over.
SC Go ahead.
CAPCOM 14, when you pass out of the region of OMNI DELTA coverage, we will ground command you over to the High Gain antenna. At this point however, you will be in a region where reflections from the spacecraft make acquisition marginal, and if we, the antenna is not automatically acquired by the time that you get to the calibration attitude, we would like you to take over and commence a normal acquisition at the optic CAL attitude for us over.
SC Okay, we'll do that.
CAPCOM Roger out.
SC Houston, 14.
CAPCOM Go ahead 14.
SC Hey, Bruce, do you want us to go OMNI DELTA now? You know we are on High Gain now.
CAPCOM 14, this is Houston.
SC (GARBLE)
CAPCOM We're controlling your antenna configuration from the ground here, just leave the configuration onboard as is, over.
SC Okay.

END OF TAPE

CAPCOM 14, Houston. We seem to have acquired a good signal strength. How do you read. Over.

SC Loud and clear, Houston, 14.

CAPCOM Roger. Out.

CAPCOM Apollo 14, this is Houston.

SC Go ahead, Houston.

CAPCOM 14 for Stu we're receiving a, I guess you could call it, a carrier from his biomed but we're getting neither the EKG nor the respiration trace and we wonder if the harness connectors to the to the signal conditioners are properly mated up. Over.

SC Understand that, Bruce I'll check that.

CAPCOM Roger. Out.

SC GARBLE.

CAPCOM Okay, thank you Stu.

SC Houston, 14, how does the rest of the crew look with biomeds?

CAPCOM 14 this is Houston. Al, you look 4.0 on the biomed. We're not receiving Ed's right now. It looks like he's either turned off or totally disconnected. Over.

SC Well, he's not on the air right now, but assuming how he looked last time we saw him yesterday GARBLE.

CAPCOM Yeah. The surgeon's telling me -

SC GARBLE.

CAPCOM Surgeon's telling me you all look in great shape and he wasn't concerned about anything he just wanted to find out what the problem was there because he was getting something that indicated the signal conditioners and all that were hooked up and the TM was turned on but we weren't getting a signal through on top of the carrier there. Over.

SC Okay. Well Ed and I did some GARBLE problems earlier and I just wondered how we were looking now. Thank you.

CAPCOM Roger. Out.

SC Houston, 14. How does the downlink look to you now?

CAPCOM In what respect, Al, biomed? Over.

SC Negative. TM.

CAPCOM All right. Looking beautiful to us.

SC Okay, we're proceeding. We didn't want you to miss the world's - expert on 23 here.

CAPCOM Oh, we won't and you can tell Stu I made a hard copy of his zero zero noun 49 yesterday. We'll present it to him framed with suitable ceremony.

SC Very good. You missed some others while you were gone somewhere else.

CAPCOM No, I was here when he made the second one too, but you don't get a framed certificate for each one.

SC Oh, okay.

END OF TAPE

CAPCOM Okay, we copy that one, Stu. Over.

SC Roger, Apparently you haven't really taken a look at what 49 should be after long periods of testing. I think we've got to expect that sort of thing, particularly on the first mark.

CAPCOM Roger, out.

CAPCOM 14, Houston, the analysis of your first mark there is that that's within about 1-1/2 sigma and indeed what we expect on the first mark after a period of time such as this. Over.

SC Roger, out.

PAO This is Apollo Control at 189 hours 04 minutes, Apollo 14 now 121 665 nautical miles from earth, a spacecraft velocity 4882 feet per second. Aboard the spacecraft at the present time Stu Roosa is in the midst of performing a series of star sightings as part of the midcourse navigation, that activity scheduled to continue for another 15 to 20 minutes. At the present time, we do not expect midcourse correction 6 to be performed. The retro fire return to earth officer reported that he considers the chances of doing that maneuver just about zero. However, the final decision won't be made probably for another hour or two anyway, and at the present time our tracking data shows that the entry interface angle, which these midcourse corrections are primarily designed to control, is negative 6.63 degrees. Nominal is 6.5, so we are very close to the normal preferred entry interface angle and it's also normal to expect these numbers to change somewhat with additional tracking as the spacecraft moves closer to earth. We have also seen no change in the time of entry interface, 216 hours 27 minutes 31 seconds, and that is essentially the same number we have been reading since yesterday after midcourse correction 5 was performed. Splashdown occurs approximately 14 minutes after entry interface or about 216 hours 41 minutes.

END OF TAPE

CAPCOM 14, this is Houston.

SC Go ahead.

CAPCOM Roger. On our telemetry, it looks like you accepted an update this last time on star 4, and our recommendation is that the updates from the first three stars be used for navigation updating and the last ones, 4, 5, and 6, just for your own benefit in testing out the P-23 techniques, but not updating the state vector. Over.

SC Okay, sorry about that Bruce.

CAPCOM Also, 14, we've noticed the cabin pressure go up slightly here, over some period of time and we're wondering if you changed the cabin configuration any. You're up to about 5.7 on our telemetry. Over.

SC Houston. We've been testing out a couple of the oxygen masks for a while this morning and that may have done it. We'll keep an eye on it.

CAPCOM Roger. It's certainly no problem, you just had the E-comms a little confused here.

SC Well, perhaps the problem was here.

END OF TAPE

PAO This is Apollo Control at 189 hours 43 minutes. The crew has completed the mid course navigation down in program 23 at this time and they'll be setting the spacecraft up in the passive thermal control mode, rotating the spacecraft slowly about its longitudinal axis at the rate of about three revolutions per hour, to maintain the proper thermal control, in drifting flight. At this time we show Apollo 14 119 775 nautical miles from earth and the velocity moving up now closer to the 5000 foot per second mark, now reading 4940 feet per second.

MADRID Madrid COMM TECH OMNI one, Madrid.

COMM TECH Madrid COMM TECH, Houston, COMM TECH, voice check. How do you read?

MADRID Roger, read you five by.

COMM TECH Roger, read you the same.

CAPCOM Apollo 14, this is Houston, we show that you're damped out sufficiently to start the spin up at this time. Over.

SC Okay Houston, we will do that briefly, thank you.

SC Houston, 14.

CAPCOM Go ahead.

SC Got a little something for you. (music from "Camelot")

SC Very good, (garble) tail end of that one.

CAPCOM I appreciate you thinking about me Al.

CAPCOM Apollo 14, this is Houston, we'd like to terminate battery Alpha charging at this time. Over.

SC Roger. (more music from "Camelot")

PAO That sounded like a smattering of "Camelot" coming to us from the spacecraft. The small portable tape recorders carried by the crew. And at the present time we show Apollo 14 118 703 nautical miles from earth, traveling at a speed of 4973 feet per second.

SC Does this copy? (music)

END OF TAPE

CAPCOM 14, this is Houston, over.

SC Go ahead Houston.

CAPCOM 14, we're still working on these docking probe procedures, and we'll give you a call later on today when we get them finalized. Over.

SC Okey Doke, Bruce, that will be fine.

CAPCOM And, for our information, can you tell us whether the contingency lunar sample decontamination bag is available in the command module or whether you jettisoned that with the LM? Over.

SC Bruce, I'm not sure we can answer that without doing some looking around. It may be here, or we may have used it. Just a minute.

CAPCOM Okay, well we don't need an answer immediately, we're considering using this bag if it's available to go over the head of the docking probe in order to protect it from any salt spray after splash down. Over.

SC Okay, we'll try and get an answer for you.

CAPCOM Thank you.

CAPCOM Al, 14, this is Houston. On our last request wont be required, we've got two other bag candidates that we've identified and we can use one of them. Over.

SC That will be fine if they didn't go to the same place as the contigency sample bag.

CAPCOM No, we're talking about is one of the temporary stowage bags with the - the purse assembly up at the top cut off, or the bag in which the hoses for the liquid transfer demo are stowed. Over.

SC Okay. We've got another little - another opener for you. I can see a shaving kit - razor bag sitting here, or the exerciser bag, should be about the same size and work very well.

CAPCOM I'm getting some headshakes down here Ed, says those bags wont fit over the head of the probe.

SC Neither of them? Doesn't matter to us. We'll put anything over it you like.

CAPCOM Okay, we can go and try those out on the mockup we had not tried to fit those two bags that you mentioned. Would you believe that we know that the temporary stowage bag, or the liquid transfer demo hose bags will fit. We'll get back to you.

SC That's fine - either one of those will be great.

CAPCOM We'll get back to you later on with the finalized procedure. Thank you.

SC Okay.

END OF TAPE

PAO This is Apollo Control at 190 hours 59 minutes. It's been very quiet, both in the control center and aboard the spacecraft, for the past hour or so. Our crew will be coming up shortly on an eat period. Now this will be their noon meal, or lunch, and following that they will be scheduled to do a fuel cell purge and will be maintaining passive thermal control aboard the spacecraft, rotating the vehicle at the rate of about 3 revolutions per hour to maintain the proper temperature control. The return-to-earth officer is in the process of computing what's called another vector - computing another - taking another look at the data and computing another trajectory vector to determine whether or not midcourse correction 6 will be required, however, his last report to the flight director was that it was - that the possibilities or the chances of doing that midcourse correction were virtually zero, and we expect that we will have a firm decision to that effect before too much longer. At the present time, Apollo 14 is 116 100 nautical miles and the velocity has gone over the 5000 foot per second mark now - 5054 feet per second. Coming up at about 192 hours 40 minutes - 192 39 45, to be more precise - Apollo 14 will have completed half of its transearth leg of the journey and at that time will be about 110 931 nautical miles from both the earth and the moon.

CAPCOM Apollo 14, this is Houston. Over.

SC Houston, 14. Go ahead.

CAPCOM In looking at your flight plan activities for this afternoon, since we are still holding on the final probe stowage procedures, we're wondering how you feel about doing some of the light flash stuff during the next hour here. Over.

SC I thought we recently discussed that as a replacement for the midcourse.

CAPCOM We did, however, we're now looking at the possibility of getting the probe tied down roughly in this time period instead. And one of the items that we're going to use, or planning to use in tying down the probe is a rendezvous window shade, and it would be hard to get good dark adaptation inside after using the window shade as a shim. Over.

SC It would also be hard to sleep this evening after using the rendezvous window shade as a shim.

CAPCOM Roger, 14, but looking ahead in the timeline for the activities coming up tomorrow, that is, after your sleep period this evening, it looks like you're going to be relatively busy, and we'd like to allocate about an hour or maybe even a little more to getting the probe configured and properly tied down in its position, and I guess - we've been looking for a good place to fit that in and we don't see an obvious slot in tomorrow's flight plan, although we could take another look at rearranging things somewhat. Over.

SC Oh, I completely agree. I think we ought to get the probe stowed today and forget about it. Hold on just a minute and we'll look at the flight plan.

CAPCOM There's a possibility we could rig some sort of a temporary window shade that might not give you complete blackness, but it could be, say taped in place and would make it dark enough inside for sleeping. Over.

SC Well, perhaps possibly put the window shade in place under the probe, get the (garble) on it and remove it tonight and then put it then put it back in tomorrow as the last step and put it down with grey tape.

CAPCOM As I say, Al, we haven't got the final procedures bought off on it yet, but looking at the interim one here the present location of it would be underneath a bulb from the flight data file and on top of a sleeping bag down on the aft heat shield with the probe strapped down pretty tightly against it using the window cover to spread out the force from one of the pitch arms so that it doesn't concentrate excessively on the aft heatshield, so that if you get it tied down very securely it may be difficult to get that window shade in and out after tying it down. Over.

SC Okay. Well, how's about looking at something else in place of the window shade, because we'd like to get a good night's sleep tonight if we can.

CAPCOM Okay. We'll look at it.

CAPCOM Apollo 14, this is Houston. Over.

SC Go ahead.

CAPCOM Okay. Back to our original question under the assumption that we are not yet ready to start stowing the probe, would you all be agreeable to trying some of this light flash observation at the present time, or after you finish eating. Over.

SC Okay. We'll go ahead and do it now, if you'd like.

CAPCOM Okay.

SC Houston, do we want to use any PSE to the voice loop or how do you want us to report this. Over.

CAPCOM Roger. You might as well use the voice loop if you just send it down under the assumption that we're on good comm here.

SC Okay.

CAPCOM Okay, the objectives stated for this period of observations are first off to confirm that it is not necessary to be dark adapted to see the flashes. Secondly, to collect the real time data on the times of occurrence as of different types of flash, and lastly to determine if there's any other sensory effect associated with this phenomena. Over.

SC Okay.

CAPCOM You're requested to - you're requested to become thoroughly light adapted, that is by looking at a flash light then relax, start the dark adaptation procedure, and report and describe flashes as they occur.

END OF TAPE

CAPCOM Apollo 14, Houston, how do you read now?

SC Okay Bruce, we lost you right after you started talking about the procedure.

CAPCOM Okay, you should configure the cabin so that you can indeed start dark adaptation procedure. And in starting that procedure, you are asked to become thoroughly light adapted as by looking at a flashlight or floodlight, then relax, start dark adaptation and report and describe flashes as they occur. Marking the time of the occurrence of the flash takes priority over detailed description. One of you should continue observation dark adapted as long as possible, the others should expose themselves to light again after about 25 minutes. We'll give you a cue on that, and repeat the experiment for another ten minutes, on as many cycles as you feel you have time for in order to increase our probability of getting flash observations during the early portion of the dark adaptation transient. We'd also like to hear from you commentary on any other unusual physical sensations, such as tingling or apparent sounds of unusual character like ringing in the ears and so forth. Over.

SC How did all that get into it?

CAPCOM Al, it's what our investigators decided he's interested in. Over.

SC Having these things aren't timebombs going off in your head you know.

SC Okay. Just being facetious, Bruce, we'll cooperate.

CAPCOM Okay. And along those lines he's looking for following data on the flashes, the type of flash, i.e. star streak, nova, etc. brightness, the location in your visual field, color if any, and whether it's possible to distinguish in which eye the flash seems to occur in. Over.

SC Okay, we understand.

CAPCOM And let us know when you start dark adaptation and we'll time it for you. Over.

SC Okay, we're (garble) put the shades in now.

CAPCOM And just for reference, we're playing back the video tapes of last evening's in-flight demonstration TV show for about the fifth time down here. I think you're going to be a best seller.

SC Oh really, glad to hear it.

SC Okay Houston, let's review what we intend to do here. Just a second. Okay, we have all three on now and we're going - we have the window shades in and cabin lights are currently on. At T zero all three of us shine a flashlight in our eyes, turn out all the lights. And that's the start of the sequence. Stu and I will recycle about once every ten minutes, Ed keeps going as long as he can stay awake. That

SC correct?

CAPCOM 14 Houston. That's correct. Except that on the first batch we'd like to keep you all in the dark adaptation procedure for about 25 minutes and then two of you start recycling at ten minute intervals. Over.

SC Understand you want all three for 25 minutes?

CAPCOM That's affirmative.

SC And then all three re-cycling?

CAPCOM Negative. One crewman whom can determine amongst you, should, when you start the dark adaptation procedure continue in the dark adapted condition until the termination of the experiment. The other two of you should do this light adaptation again after 25 minutes and then re-cycle on a ten minute basis. Over.

SC Okay, well, it looks to me like we'll probably have time for one 25 minute cycle, and that's probably about it. We have a P52 coming up here at 192:10.

CAPCOM Roger, we see that in the flight plan.

SC Okay. Alright all three of us will go for 25 minutes, Ed will continue on and we'll discuss how the other two will go from there.

CAPCOM Roger.

SC Give me one minute to get the flashlights ready, we'll give you a mark here in about 40 seconds. Okay, T zero will be 191000. Here we go.

CAPCOM Roger, Al. Minus one second -

SC Okay, it's mark. Okay, it's all dark.

END OF TAPE

CAPCOM Yea, 14 this is Houston. Nothing heard for 16 minutes over.

SC That's correct. Not only correct, but unusual Bruce.

CAPCOM Run that one by again - -

SC It's almost unbelievable Bruce.

CAPCOM Run that one by again Ed.

SC I say it's unusual, I think most of us see him long before now.

SC Well, if we don't see anything by 20 minutes, I suggest we terminating and try to give you some more qualitative information during tonights sleep period.

SC Okay, mark a faint star left eye, at 10 o'clock.

CAPCOM Roger, faint star west eye at 10 o'clock.

SC Okay, mark vertical trace right on it.

CAPCOM Roger, Al.

SC 9 o'clock, 9 o'clock.

SC High left to the lower right.

CAPCOM Roger, Ed. Have a color on any of these?

SC What again.

CAPCOM Do you have a color on these?

SC These have both been white so far.

CAPCOM Roger.

SC Houston, we all have a consensus that we've never seen anything thats colored.

CAPCOM Roger out.

SC Mark, is a cloud at 12 o'clock high left eye.

CAPCOM Roger Ed.

SC Mark, right eye, 8 o'clock low, single flash.

CAPCOM Roger Al.

CAPCOM Hows the redheaded cosmic ray detector doing?

SC He's sleeping, I think.

SC It must not be my time for stars.

SC He's down in the LEV. He's sheilded by the map base.

END OF TAPE

SC Mark, 10 o'clock about level and a double star.

CAPCOM Roger, Ed.

SC Left eye and believe it or not it has kind of a bluish tint to it.

CAPCOM Roger, Ed.

SC Al, it looks more like a blue diamond quite the blue kind.

SC Roger, Ed. MARK left, eye sync flash 9:00 o'clock.

CAPCOM Roger, Al.

SC Burnt streak, left eye 12:00 o'clock low and was going from the bottom towards the top.

CAPCOM Apollo 14 this is Houston, 23 minutes and 34 seconds into the test and at 25 minutes we would like Ed and Ed only to shine a flashlight in his eyes long enough to ruin his dark adaptation and then start the dark adaptation procedure again. We'd like to be sure that you don't shine the flashlight in anybody elses eyes.

SC Well, they'll just have to close their eyes then, I guess.

CAPCOM Okay, I'll give you a hack in 25 minutes.

SC Lower that signal in my left eye, should I just dark out that one?

CAPCOM Mark low at 6:00 o'clock and with a double flash in left eye.

SC Roger.

CAPCOM All right, Ed, let's not go halfway , let's do the whole job, you're going to layup both your eyeballs and we're 24 minutes, 50 seconds and counting.

SC Okay.

CAPCOM Mark 25 minutes and let us know when you turn the light back out.

SC Okay, the light is out.

CAPCOM Roger, Ed.

SC I can't see anything for days after that one.

SC Mark right eye at - it'd be the 3 o'clock low and it was a streak right to left.

CAPCOM Roger, Ed. That was about 51 seconds when you go over there.

SC Yeah, I had a mark right in the middle of that conversation, left eye, 12 o'clock, high signal flash.

CAPCOM Roger, Al.

SC Mark cloud 12 o'clock high, both eyes.

CAPCOM Roger, Ed.

SC I prefer the same from that mark.

SC Mark, left eye streaked from 6 o'clock to the center - going up.

CAPCOM Roger, Al.

SC Mark streaked left eye.

CAPCOM Roger.

SC Going left to lower right. Mark right eye, 4 o'lock pretty much on the periphery first flash.

CAPCOM Roger.

SC MARK. Right eye no GARBLE, right in the middle.

PAO This is Apollo Control. The crew has been observing light flashes for an experimental observation that began about 30 minutes ago and is scheduled to continue for about another 30 minutes reporting - observing of reporting observable light flashes which have been atributed to cosmic rays. As they give a mark, experimenters in the science support room here in the control center note the time of it and a few seconds later the crewman describes the observation of the type and location as it was viewed in the eye and so far we've heard from Shepard and Mitchell. I haven't detected any reports from Command Module Pilot, Stu Roosa.

SC Mark, right eye 11 o'clock on the peripheral restraint flash.

CAPCOM Roger, Al.

SC Mark right eye about 5 o'clock, halfway up flash. GARBLE.

SC Left eye too cloud.

SC Mark right eye 3 o'clock flash on the periphery.

CAPCOM Roger Stu, Roger Ed, Roger Stu.

SC Mark flash right eye 2.9.

SC Mark 7 o'clock flash on the periphery

SC Simultaneous with Stu, Al at a lightning behind cloud and low right eye. Mark right eye.

SC Mark right eye, 4 o'clock.

SC Here's a periphery of a faint nova.

CAPCOM Roger, Al.

SC Mark, flash right eye GARBLE.

CAPCOM Say again that last part of that Ed, you hurried up.

SC GARBLE when I had a cloud at 11 o'clock. Mark left eye nine o'clock, top and bottom.

CAPCOM Roger, Al.

CAPCOM Ed, this is Houston. We'd like you to repeat the exposure of your eyeballs to light cycle and start readapting again. We want Stu and Al to continue in the dark adapted condition. Over.

SC Okay, how much longer do you project this to run, Bruce?

CAPCOM Say again, Al.

SC Mark right eye.

SC I wonder what Ed did with the flashlight.

SC How much longer you think you're going to be running this test?

CAPCOM A total of about 10 minutes more and then we'll come out and Stu can start the P52 and we'll be back in business.

SC Okay, sounds good.

CAPCOM Roger. Currently I've got 191 plus 57 or 13 minutes until a block in the flight plan for starting the P52 so I think we're still in good shape.

SC Okay, Mark Bruce, I'm starting my adaptation again.

CAPCOM Roger, Ed.

END OF TAPE

SC Mark right eye streak, center going out three o'clock.
CAPCOM Roger, Stu.
SC Mark Nova, right eye at three o'clock.
CAPCOM Roger, Ed.
SC Mark flash, five o'clock about half way out.
CAPCOM Roger, Stu.
SC Mark left eye, twelve o'clock high flash, mark Nova, right eye low. (Garble) Low.
CAPCOM Okay, we got those in.
SC The documentation on spacecraft, orientation. Al is in the left couch looking up and Ed is in the right couch looking up and Stu's in the LEB facing Mecca.
CAPCOM Understand. Stu is in the LEB facing the nav bace?
SC To each his own.
SC No. I'm floating in the LEB, Bruce, but I'm looking toward plus X.
CAPCOM Roger, we couldn't find Mecca on the stowage list there.
SC Mark flash right eye at twelve o'clock. Level.
CAPCOM Roger, Ed.
SC Mark streak, right eye, from upper right to the center.
CAPCOM Roger Ed.
SC Mark right eye, 8 o'clock, flash.
CAPCOM Roger, Al.
SC Mark flash, right eye three o'clock.
CAPCOM Roger, Ed, and 14, this is Houston. We have a query here. Wondering how long in terms of angular measurement those streaks are? Over.
CAPCOM I should say apparent angular measurement.
SC Mine are - Mine have been about half an eyeball in diameter.
SC Mark, double shot in the right eye ten o'clock and seven o'clock.
CAPCOM Roger Ed and Roger, Al.
SC Mark, double shot in the right eye, ten o'clock and center.
SC Flash at the same time, right eye at two o'clock.
CAPCOM Roger.
SC Mark streak right on the periphery at 3 o'clock left eye going vertical. About on the top.
CAPCOM Roger, Stu.
SC Mark a flash, (garble) eye, 2 o'clock.

SC Mark a bright flash, right eye, one o'clock high.

END OF TAPE

SC Mark, flash, at 4 o'clock, about half way out, right eye.

CAPCOM Roger Stu.

SC Mark dem flash at right eye center.

CAPCOM Roger Al.

SC Mark, flash, 2 o'clock on the (GARBLE) right eye.

CAPCOM Roger.

CAPCOM Apollo 14, this is Houston, we're going to terminate the light flash investigation at this time. We would like to convey our appreciation to all three of you for cooperating in the investigation. The investigators are very happy with the data that you have given them and I think they will be able to get something significant out of it over.

SC Mark flash at 1 o'clock on the (GARBLE)

CAPCOM Roger, 14, we can -

SC Okay, Bruce.

CAPCOM Terminate the experiment, and proceed with the P52, Stu.

SC Okay, and Bruce I'd just like to make a comment, I don't know whether it's my position down in LEV or why, but even with those up in the couches that's not near as many flashes as I've seen in other times.

SC Yea, and I was going to remark Bruce, that most of the times when I've observed them, have been after sleep. Generaly I get to fall asleep as fast when we turn in that there's not time to observe them, but they always seem very bright, much brighter than right now, than they were this pass. I don't know whether more numerous, perhaps more numerous but always brighter than they were today.

CAPCOM Roger, we copy that Ed. Thank you.

SC Did you get Stu. He concurs on that.

SC Yea, I said on the intercomm that I agree to that also Bruce. Like last night I was laying there and there were just you know just big bright ones all over the place, and these seemed like were a little subdued compared to that.

CAPCOM Roger.

SC Well let's see, that should put us at about 104 per cent completion of the flight plan items.

CAPCOM I'll run that one by the FAL and see what he has got to say.

CAPCOM 14, a brief update on things. We have cancelled midcourse correction number 6 at this time. Based on our tracking. The preliminary estimates are that midcourse 7 will not be required, however, we wont be able to make that decision with certainty until tomorrow. Based on MSFN tracking, your GAMA at entry interface, is minus 6.35 degrees. Based on your onboard navigated state vector, it's minus 6.68.

CAPCOM so we're showing very good agreement there.

SC Say the MSFN angle again, Bruce.

CAPCOM Roger Stu, the MSFN angle is minus 6.35. The angle derived from your onboard navigated state vector is minus 6.68, over.

SC Okay. this should come together as the marks continue shouldn't it?

CAPCOM That's our expectations, Stu.

CAPCOM Okay, Stu, we've got them, and looking good.

SC Okay. Okay, Bruce, and we'll torque at 192 14 25.

CAPCOM Roger, Stu. Run that time by again please.

SC 192 14 25.

CAPCOM Roger.

END OF TAPE

PAO This is Apollo Control at 192 hours 18 minutes. Apollo 14 now 112 226 nautical miles from earth traveling at a speed of 5180 feet per second or just a little bit under 1 mile per second. At 3 pm today in the news center auditorium, there will be an Apollo 14 science briefing. Those participating will be Lee R. Scherer, NASA's Director of Apollo Lunar Exploration; Dr. Gene M. Simmons, the Manned Spacecraft Center's Chief Scientist; Dr. Paul W. Gast, Chief of the Manned Spacecraft Center's Lunar Planetary Sciences Division; Dr. Robin Brett, Chief of the Geochemistry Branch at the Manned Spacecraft Center; Dr. Gordon Swann of the U.S. Geological Survey, who is a principal investigator on Apollo 14 for lunar field geology experiment. This briefing, again, at 3 pm in the MSC auditorium - the main auditorium in building 1.

PAO This is Apollo Control at 192 hours 46 minutes. A press conference on Apollo 14 Lunar Science is scheduled to begin at this time in the MSC building number 1 main auditorium. We'll switch to that press conference now and record Apollo 14 air to ground for play back following the press conference.

END OF TAPE

PAO This is Apollo Control at 193 hours, 46 minutes. During the press conference we accumulated about 3 to 4 minutes of taped conversation. We'll be prepared to play that back. The primary activity aboard the spacecraft during the press conference involved Program 23, mid-course navigational sightings using the spacecraft sextant and we'll play back the tape at this time before continuing to stand by live.

CAPCOM Apollo 14, this is Houston.

SC Go ahead.

CAPCOM Stand by.

SC Apollo 14. Did you call?

CAPCOM Roger, 14. This is Houston. We would like you to go to an attitude for thermal control, not PTC, and maintain that attitude until the beginning of the TV coverage for the press conference and right attitude is roll 262, pitch 090, yaw 000. Over.

SC Roger. 262, 090, 000.

CAPCOM Roger.

SC I got that.

CAPCOM 14, this is Houston. Request you terminate the waste water dump now in progress. Over.

CAPCOM Apollo 14, this is Houston. Over.

SC Shepard is turning it off now.

CAPCOM Roger.

CAPCOM 14, this is Houston. When you can give us POO and ACCEPT we have a state vector and a clock update for you. Over.

SC (garble)

CAPCOM Roger, Stu. You're very weak.

SC Well, how now. Maybe it works better if I talk into the mike. We're POO and ACCEPT.

CAPCOM Now it comes through all clear.

CAPCOM And for your information, Stu, based on your last set of P23s, your navigated state vector has a gamma at entry enterphase of minus 6.74, misfin solution of minus 6.35 remains unchanges. Over.

SC Well, didn't sound like it helped as much.

CAPCOM Well, you might be right, who knows.

SC Say, Bruce. Observe the high gain starting to oscillate. What would you like to do with it?

CAPCOM Yes, they tell me that you don't normally go with that now. We'll get you something to do with the high gain.

SC If we're on OMNI Delta it's news to me.

CAPCOM Stand by, please.

CAPCOM 14, this is Houston. We've uplinked commanded you to OMNI Delta. We'd like you to park the high gain antenna at pitch minus 52, yaw 270. Over.

SC Willco.

CAPCOM And I have a brief flight plan update for you when you're ready to copy.

SC Go ahead.

CAPCOM Okay. Do not go into PTC until a GET of 198 plus 45. Over.

SC Okay. Do not go to PTC until 198 plus 45.

CAPCOM Okay. At 194 plus 50 a VERB 49 maneuver to the TV attitude which is roll 325, 090, 0- 0. In that attitude, high gain antenna pitch plus 32, yaw 270. Over.

SC Okay. 194 plus 50, VERB 49 to TV attitude 325, 090, 000, with a high gain angles at 32 and 270.

CAPCOM Roger. And the TV pass is scheduled from 195 plus 07 through 195 plus 37. Over.

SC Understand TV 195:07 through 195:37.

CAPCOM Readback correct. That completes the flight plan update and the computer is yours. Over.

SC Okay, Bruce. The computer is mine and how about me going to wide deadband here while we're sitting here and until after the TV show.

CAPCOM Roger, Stu. We concur. And I'll have a - -

SC Okay.

CAPCOM - - an entry pad here for you shortly. And then we'll be ready to start in on the great probe storage exercise.

SC All right.

CAPCOM Apollo 14, this is Houston. I have an entry pad and a CSM state vector pad for you. Over.

SC Okay. Stand by.

SC We're ready to copy the entry pad, Bruce.

CAPCOM Roger, Ed. Mid-Pacific entry pad, roll 000, 154, 000, 216, 10, 47, 267 minus 2702, 17264, max G 061, 36170, 635, 11350, 36251, on RT 216, 27, 47, 0029, NOUN 69 is NA 30, 400, 0210, 0018, 0336, 0803, sextant star 30, 3543, 307, Boresite star - - up 211, left 28, up lift vector comet 1. Use non-exit EMS pattern, 2 moon check attitude, moon at left of window, roll 000, pitch 182, yaw 000. Number 3, moon set GET 216 plus 25 plus 15. Number 4, RET - - 6 plus 25. Main deploy 8 plus 51. Landing 13 plus 48. Number 5, constant G entry is roll right, right 6 GDC aline, Sirius and Rigel, 322, 325, 018. Number 7 - -

END OF TAPE

CAPCOM 018, number 7, the attitude .05G and the GDC aline on both. Assume a P52 nominal alinement, option 2 using the RRT time of 216 plus 27 plus 47. Read back. Over.

SC Okay, Bruce. I think the only thing I missed was the Boresite star angles. I have a up 2-11 and a left something.

CAPCOM Okay, left 2.8. Over.

SC Okay, midpack 000154000 2.6 1047267 minus 2702 minus 1726406136170 63511350 36251 21627470029. NA equal 0 is 400 0210 0018 06 0803 000 3543 307, zero hyka up 211, left 28, state vector up. And use 9x VMF pattern, moon check attitude is ROLL 000, PITCH 183, YAW 000. (garble) left (garble) RET F90 K is 6 plus 25. The MAINS is 8 plus 51, the banding is 13 plus 48. On the constant G, Reentry it's ROLL right, GDC aline stars are Sirius and Rigel angles are 332 325018 and the moon set and moon check times, I believe he said P52 using option 3 option 2 and RRT time of 216747.

CAPCOM 14, this is Houston. Your readback is correct. The attitudes that I was referencing you were the .05G attitude and the GDC aline angles. Your statements regarding moonset and all that, however, are also correct. Over.

SC Okay.

CAPCOM And Stuart, I've got a CSM state vector pad if you're ready to copy.

SC Stand by, please.

CAPCOM 14, this is Houston. I'm ready with the P27 state vector pad now.

SC Okay.

CAPCOM Okay. It's a verb 71, the index is 21, and here we go on line 02, 015010000174563623S4 10577 102424 line 10 03452 14667 00467 37210 73721 line 15 60164 75626 44713 10452 21000. Read back. Over.

SC Okay, Bruce. Before I start, give me a time on this.

CAPCOM Roger, Stu. It's GET of 200 hours even that's 200 plus 00 plus 00. Over.

SC Okay. State vector verb 71 to 200 hrs on the money, index 21 01501. How do you read, Bruce?

CAPCOM Okay. I was reading you before and I have my volume all the way turned up here now so I really read you Stu.

SC Oh, okay. I just realized that my mike had slipped right. I'll start on 02 0150100 0017456362354 105771022403452 1466700467 37210 73721 60164 75626 44713 10452 21000.

CAPCOM Roger, 14. Readback is correct.

SC Okay, thank you Bruce.

CAPCOM 14, this is Houston. We're ready to go on the probe storage at the present time. However, it was our intent to give you about 1/2 hour of free time prior to commencing the TV pass for the press conference to let you get configured in whatever mode you want up there. So, we've got a couple of break points in this procedure, and if you concur, we could start into this and give it about 30 minutes worth and then knock it off for the TV show. Over.

SC Roger. Read you.

SC Yes, about all we have to do for the TV show is to get the camera set up and actually, Stu and I will be stowing the probe and Ed could be setting up the camera. So we can work simultaneously.

CAPCOM Roger.

SC (garble)

CAPCOM 14, this is Houston. As a preliminary to the probe storage proper, we'd like to review a few storage items before entry with you. Over.

SC Can you hear.

SC Okay, go ahead.

CAPCOM Okay, you might get up a little closer -

SC We can do all this in real time now, we don't have to rush now, is that right?

CAPCOM That's correct. The first few steps will be probably informational rather then anything else and then we'll get into the realtime stuff.

CAPCOM 14, Houston.

SC Go ahead.

CAPCOM It is our understanding that you have 2 decontamination bags at the present time, one weighing about 20 pounds and one weighing about 30 pounds. The 30 pound decontamination bag and contents should be stowed on top of locker alpha 13 for reentry, using the existing tie down rings. Over.

SC Stand by 1, a minute Bruce.

CAPCOM Roger.

SC Give us about 5 minutes Bruce and we'll have the A10 in shape for you here. Stand by.

CAPCOM Okay, now before you do too much with the A10 situation, it's our understanding that you currently have a 20 pound bag on top of a 10 and we're going to ask you to move that over to the top of A8 for entry, and of course, once you latch this down on top of A8

END OF TAPE

CAPCOM - - and of course once you latch this down on top of 88, which is not necessary to do right now, your locking your inflight demo, the composite casting into place there and you want to be sure and get as far through that as it is your intention to do prior to latching down A 80. Over.

SC Okay. We understand that.

SC Okay, Bruce. Now, let's go back to the bag that you want on A13. Make sure that I've got that one.

CAPCOM Okay, Stu. We want the 30 pound decontamination bag on top of A13 for entry. It is not necessary to lash this down at the present time unless you desire. Over.

SC Okay. We'll put the 30 pounder on top of A13 and we'll lash it down at our convenience.

CAPCOM Roger.

SC And I guess we're ready to press on when you are, Bruce.

CAPCOM Okay, Stu, then we're going to have the 20 pound decontamination bag on top of A8 for entry and again it's not necessary to lash this down yet. Over.

SC Okay. 20 pounder on A8.

CAPCOM Next, it's intended to stow the IV pressure garment assembly, that is yours, with its helmet in a sleeping bag on top of the 28 on top of the 20 pound bag on A8. Use LM webbing and the D rings on the container for tie downs. Once again this can be delayed. Over.

SC Okay. And we'll put my suit, helmet, gloves in a sleeping bag and tie it on top of the 28 pounder on A8.

CAPCOM Roger. Then after that's all through you need to verify a nominal 4 inch clearance to the couch. Over.

SC Okay. 4 inch clearance to the couch.

CAPCOM Okay. We need you in real time here to go through locker Alpha 10 and remove anything that may be needed later on in the flight prior to entry, such as 70 mil magazines for his hold camera or whatever you feel you'll require. Over.

SC Okay. Stand by one.

CAPCOM And Stu, one item that we'd like you to remove from A10 at this time is the bag that contains the hoses for the liquid transfer demonstration. Over.

CAPCOM And that's just a bag because we're going to place the bag over the probe head later on and tape it in place, so you want to leave the hoses in it if you can.

SC Okay. That clarifies that.

SC Okay, Bruce. A10 is secured to our

SC satisfaction.

CAPCOM Roger, Stu. And now in locker Alpha 5, we'd like you to remove the headrest pads and install them on the couches. Over.

SC Okay. It worked.

CAPCOM Also the heel clips and 5 ropes, while you're down there temporarily.

SC Okay. Okay, Bruce. That's accomplished.

CAPCOM Okay. You've got the heel clips and the ropes and the head rest pads out and installed on the couch. Okay.

SC (garble)

CAPCOM Roger. And we want everything else removed from the right hand side of A5, that is the cushion and added equipment that is in there and stow that in BRAVO 1 the main food locker. Over.

SC It worked.

SC Okay, Bruce. A5 is all clean.

CAPCOM Roger, Stu. Now, we'd like you to remove the two lithium hydroxide canisters from Alpha 6 and place them in the left hand side of Alpha 5. Over.

SC It worked.

CAPCOM And while you're over there in Alpha 6 you might as well get all the rest of the stuff, the TV equipment out of it.

SC Okay.

SC Houston, 14.

CAPCOM Go ahead, 14.

SC Okay. Now, you want the cushion out of the right side of A6. Is that affirmative? Or just the TV gear?

CAPCOM Okay, Stu. Not required that you take the cushion out of the right hand side of - or out of A6. We do want the TV gear out. Ultimately, we're going to stow the TV equipment from Alpha 6 in the Bravo 1 food locker with the monitor wrapped in a constant wear garmet, but since we're coming up on the press conference, you want to keep it out for operation at the present time. Over.

SC Okay. So we now have A6 completely empty except for the cushion in the right side.

CAPCOM That's affirmative and Alpha 5 ought to have two lithium hydroxide canisters in the left hand side of it and the right hand side of it ought to be completely empty. Over.

SC Okay. We are in that configuration.

CAPCOM Roger. Now we need somebody that is qualified to tie knots.

SC Okay. As I said before, we've got two sailors.

CAPCOM Okay. We want you to double one of

CAPCOM the sleep restraint ropes and to tie it to the plus Y plus Z foot pad on the aft bulkhead belonging to Alpha 6. As a preliminary you should remove the urine bag from under Alpha 6 to allow you to get under there with one hand. You can put a hand underneath and a hand around the slide door at panel 250 and this is the plus Y plus Z - ward foot pad of Alpha 6 and it's the one that is closest to panel 250 down there in the corner. Over.

SC Okay. So we should take the bag completely out from underneath, right?

CAPCOM Roger. You can restow that back in there after you get the rope tied on, but it makes access a lot easier in itself for this step.

SC Okay.

CAPCOM And you want to tie the knot using as little of the line as is convenient, probably a bowline or something like that to - the thing is going to come up to tie around part of the probe.

SC In work.

CAPCOM Roger.

SC Okay. Do you want this thing outside the foot pad or inside the foot pad?

CAPCOM Okay. We'd like it trending through the space between the Alpha 6 locker and the waste management panel, so I guess it would - that would probably be outside.

SC On the loose end of this line do you want a bight or do you want just the bitter ends.

CAPCOM On the loose end of it Al, which is really a double end as I assume you're tieing it on there is no particular requirements. You're just going to tie the doubled up piece of line around a part of the probe later on. Over.

SC Okay.

SC Okay, Bruce. That step is completed.

CAPCOM Roger, Stu. Then we want you to take 3 ropes - -

END OF TAPE

CAPCOM Roger, Stu. Then we want you to take 3 ropes that you've removed from A5 there and tie one end of all three either collectively or one at a time to the A6 at bulkhead footpad, that's in the plus Y minus Z direction. That's the one on the box there that's - it's closer to the side hatch than the one you just tied the one doubled up rope around. Over.

SC Okay. You want 3 ropes. The ends tied around that one. That's four.

CAPCOM That's correct. You're going to come off of there with effectively a triple strand of line the full length. Over.

SC Okay, Bruce. We've got we've got three more snakes on the loose.

CAPCOM Okay. Now that you've got the additional snakes tied to Alpha 6, you can put the urine bag back underneath it unless you anticipate needing this assembly prior to entry.

SC Okay. We'll put it back underneath it.

CAPCOM Roger.

SC Okay. Let's press

CAPCOM Okay, Stu. Now, we'd like to move over to the probe and ensure that the probe umbilical power connectors are connected to the shorting forks and that the probe is fully folded. Over.

SC Okay. I'll verify that.

CAPCOM Is that an in work or an accomplished

SC Well, I verified those steps, but we're going to have to stand by right now, here. We're going to have to get the probe down out of the tunnel.

CAPCOM Okay.

SC Okay. We have the probe.

CAPCOM Okay, let's go, 21 Nancy there, if you'll verify that the probe connectors are connected to the shorting plugs and that the probe is fully folded.

SC Well, the umbilicals are connected to the shorting plugs and I don't know if there's something then that's fully folded, you know, the probe's folded up as you bring it out of the tunnel.

CAPCOM Okay, and Stu.

SC I haven't done anything other than just a normal probe removal.

CAPCOM Yes, you might check to make sure that the - oh Teflon block there on the side is against the rachet housing on the arm there that engages into the tunnel.

SC Okay.

SC Bruce, are you waiting on us?

CAPCOM Affirmative.

SC Okay. We're ready to go. The probe

SC is folded.

CAPCOM Okay. We'd like you to take two of the nominal 8 and 1/2 by 11 size flight data file books and tape them to the face where the capture latch release handle under the probe. We've got tape in R6 and it's your option as to which books you use, probably the CSM rescue book and the CMP solo book or the lunar land mark map - would be good candidates.

SC Okay.

CAPCOM And just by way of information when we get this stowed, these books are going to come to rest against the right hand equipment bay panel down there to the right of 251.

SC Okay.

SC Okay. We have the CSM lunar land mark map book, which is about 5/8 of an inch thick. Is that satisfactory?

CAPCOM Roger. That should be satisfactory by itself.

SC Okay, Bruce. We have a book in hand and ready to go.

CAPCOM Okay. You want to place that across the base end of the probe assembly there across the capture latch release handle and this is going to be the padding that distributes the load a little bit from the base end of the probe assembly onto the paneling down there in the right hand equipment bay, hatchwise from panel 252, so you just want to tape it across the base there so that it'll be sure and stay in position. Over.

SC Okay.

SC Okay, Bruce. The book is taped to the base of the probe.

CAPCOM Roger, Stu. And what we'd like you to do next is to place a bag over the probe head and the latest information shows that that liquid transfer demo hose bag probably will not fit and therefore you can stow that either in Bravo 1 or back in Alpha 10, your option. And we're recommending that you take an unused temporary stowage bag, that is one that's not currently in use, and cut the mechanism off the top of the temporary stowage bag place that over the probe head and tape it in place. Over.

CAPCOM What we're trying to do here is protect the mechanism in the probe head against possible salt water or salt spray splashing in during the recovery. Over.

SC Okay. We're just looking around and the temporary stowage bags are all filled at the moment. Hold on.

CAPCOM And 14, Houston. Since you don't have anything else to do right now, why we'd like you to press on to the TV attitude, 325, 090, and 000, and acquire

CAPCOM on the high gain when you get there. Over.

SC Okay. 325, 090, 0 - 90.

CAPCOM 325, 090, and 000.

SC Okay. We on the way.

SC No disregards now.

SC Houston, 14.

CAPCOM Go ahead, 14.

SC Okay, Bruce. We've got this bag that the hatch - the hatch - window bracket for the camera, you know, they used on the 0 phase and we asked to stand by - 70 millimeter camera hatch window adapter bag and it's big enough to go over the probe head. We just sweat it a little bit.

CAPCOM Beautiful Stu. If you can get that over and tape it down so that you have a water - salt water spray protection on the probe head, that's all we need. Over.

SC Okay. We'll do that.

END OF TAPE

CAPCOM 14, this is Houston. How are you reading me now? Over.

SC No COMM.

PAO This is Apollo Control at 194 hours 15 minutes ground elapsed time. The crew of Apollo 14 now swiveling the high gain antenna around for a lock on with the Earth. In this case it'll be the Goldstone station just coming into acquisition at this time. Fairly low elevation angle. Preparing for the television pass to begin in about 7 minutes. This particular television pass will be a Space Press Conference. Fourteen questions have been submitted by newsmen covering the Apollo 14 Mission. They will be read up to the crew by Spacecraft Communicator Gordon Fullerton, who is just at this moment taking over the Capcom console. As a matter of fact, the TV pass starts right at the shift handover when Jerry Griffins team of Flight Controllers, the Gold Team, takes over from the outgoing maroon team headed up by Milt Windler. Still a lot of noise on the circuit as we wait for the high gain antenna to acquire and get a solid lock on. We'll leave the circuit up live at this time and follow the communications and the subsequent television.

CAPCOM Apollo 14, Apollo 14. How do you read? Over.

CAPCOM Apollo 14, Apollo 14. How do you read? Over.

CAPCOM Apollo 14, Apollo 14. How do you read? Over.

END OF TAPE

CAPCOM Apollo 14, Apollo 14. This is Houston request OMNI Charlie. Request OMNI Charlie in the blind. Over.

CAPCOM Apollo 14, this is Houston. Request OMNI Charlie, OMNI Charlie in the blind. Over.

CAPCOM Apollo 14, Apollo 14, this is Houston. Request OMNI Charlie in the blind. Over.

CAPCOM Apollo 14, Apollo 14, this is Houston. How do you read? Over.

SC We read you loud and clear.

CAPCOM Roger, 14. Now we'd like to stow the probe temporarily in some convenient location and prepare for the press conference and I'll turn it over to Gordon here.

SC I took your downlink down.

CAPCOM Roger. We've got a beautiful picture here.

SC Be ready to go any time.

CAPCOM Okay Al. The questions that you'll be asked at this news conference have been submitted by newsmen here at the Manned Spacecraft Center who have been covering the flight.

SC Gordo.

CAPCOM Go ahead, Al.

SC Could you hold on just a minute. We'll get in position to answer the questions.

CAPCOM All right. Fine. Just let us - when - let us know when you're ready.

CAPCOM And for your information, we're getting a very good picture -

SC Are you getting a picture now?

CAPCOM That's affirmative. Good picture. All three of you in there.

CAPCOM The questions that you'll be asked at this news conference have been submitted here at the Manned Spacecraft Center by newsmen who have been covering the flight. Some of the questions they raised have been answered in your communications with Mission Control but the public, at large, has not necessarily heard them in order to specify by them. First of all for Al and Ed. Cone Crater, first of all for Al and Ed. Cone Crater was your major objective on your second moon walk. You almost made the rim. How close do you think you got and do you believe you collected enough rocks and samples to accomplish the purpose of your mission?

SHEPARD I think so. Let me take the first part of it with respect to how close we got. I think we were within perhaps 100 yards or less of the rim and certainly in a boulder field that was right there associated with

SHEPERD the boulders in the rim.

MITCHELL I agree with Al. I think we were in 100 - 150 yards and I think the majority of the type rocks - that you find at the rim were in the boulder field that we were working and although it was a disappointment. Just as its been a challenge not to get up there I think we accomplished the scientific objectives that we looked for.

CAPCOM It is hard for us to get a feel for what it was like in a large boulder field. Was it a forest of big rocks higher than you? Could you see any distance? Over.

SHEPERD The rocks that we were in - ranging them different sizes. They ranged up to 10 or 12 feet in height above us so at times we were behind rocks that were taller than we were. As far as stability concerned, Ed, do you want comment on that?

MITCHELL Ah yes. We just had a great deal of trouble moving around the rocks. We didn't even have trouble moving the MET around the rocks except we did have to dodge them - of course had to be a bit more careful with the MET than walking without it. Our major problem however, was the undulating terrain where you simply couldn't see more than 100 to 150 yards away from you and see landmarks. Consequently we're never quite sure what landmark would appear when you topped the next ridge and we were very surprised when we topped the ridge - approach the ridge which we thought to be the rim of Cone Crater to find there was another one beyond it and that was the beginning of the real problem.

CAPCOM The next question is tell us about your problems of fatigue, orientation and visibility and apply them if you will to the longer 7 hour moon walks planned for Apollo 15.

SHEPERD Well, I guess we didn't realize that we had problems of fatigue and visibility. As far as we were concerned our only problem was the amount of time alotted for the excursion. We - I don't exactly know what our heart rates were. Obviously they were higher than the normal sitting rate but we still were not operating at maximum capacity of our backpacks for cooling nor were we operating for extended periods of time at high heart rates. To us it was just a matter of working against the clock. I think that we had the capability to go longer from the standpoint of fatigue - I don't believe that we were disoriented or lost at any time at all either.

MITCHELL I agree with Al. If my previous venture mislead you it was only a matter of context because giving

MITCHELL a few minutes to look around we figured out where we were but trying to do it rapidly made it difficult and as Al says, time was our major factor. Given another 30 or 40 minutes I think we could have reached the top of Cone Crater, covered all of our objectives and get back in good fashion.

SHEPERD Well let me add one thing here. I think if we had wanted to reach the top of the crater and did nothing else that we could have done that within the time period allotted but I think that this method in which we reverted to that of collecting rocks from a point not quite near the top of the crater provided a lot more geologically and gave us a better cross section of the rocks in the area and therefore a better chance of getting rocks ejected from imbrium than had we gone to the crater and back and not collected as many rocks.

CAPCOM The next question is for Stu Roosa. Stu. What did you see of the lunar module from orbit?

ROOSA Okay. The first pass that I made on the landmark tracking, I picked the LM up with no problem. It just showed up as a white spot obviously something foreign to the lunar surface reflecting light but the ringer was the long shadow put out. The first day I tracked it, why the sun angle was still pretty low and you could see the shadow coming out and the shadow and the reflection cinched it as the LM. Now you couldn't see a shape of the LM as such but - with no doubt, the LM was there. And on the next day as I was doing landmark tracking, it was not on the schedule to track the LM again, however, I had a landmark just prior to the Fra Mauro region and one after it and I was in forma - the right attitude for landmark tracking so I looked for the LM again - apparently this time without any trouble - the shadow had diminished to almost nothing - -

END OF TAPE

ROOSA to landmark just prior to the Fra Mauro region and one after it, and I was in the right attitude for landmark tracking so I looked for the LM again and found it this time without any trouble, the shadow had diminished to almost nothing, or it was very small, but here again, then I could see the glint coming off the ALSEP. At this time the ALSEP had been deployed so I could see the glint coming off it, and I checked with Ron Evans later and told him what I thought it was and he agreed that that was the ALSEP location.

CAPCOM The next question is also for you, Stu. A top priority for you is taking detailed pictures of the Descartes Crater as a possible landing site for a later mission. Since your big camera was broken, do you think you got enough high resolution photos?

ROOSA Well, I guess I'd say yes. We made 3 passes and - with the 500 millimeter, using what we call the COAS maneuver or you PITCH and keep the camera on the Descarte landing site and this way you get a real good stereo. And I guess we'll have to develop the pictures and see how they are, but I'd say the answer to that is probably yes, but I really can't answer it completely at this time.

CAPCOM Was there a docking problem, and battery problem, abort switch problem and a problem with the landing radar? How concerned were you about not making a successful landing or a safe return?

MITCHELL This is Ed. I never doubted it for a minute we were going to make it.

ROOSA Well, I guess we're always concerned about the operation of the equipment. That's what we're up here for to assure that it operates to the best of our ability as as well as it's designed to function all the time. We're always concerned about that and we still are - I still have a little bit of this voice left to go, and we're still concerned about a safe return. I think that anyones that's involved in this kind of a business of a research line, has to be concerned until the flights totally over.

MITCHELL I'd like o - to make one other comment too about the question about the news pictures of Descartes. The photographic technique which we used is essentially the same as Apollo 12 used which took the pictures of the area in which it landed. We feel that was successful.

CAPCOM The next question "Other crews had trouble with dust. How did that affect you on landing, on the surface, and on the way back?"

SHEPARD Well, let me take the landing part, and I'll give Ed the surface part and I'll let Stu handle the way back part. As far as the landing was concerned, there was less dust than I figured, and I think that was generally born out as we progressed through our EVA, but the dust

SHEPARD started forming, I think, approximtely 100 feet above the surface, maybe 150. It was a thin layer, as we've seen before, but was less dense than I expected. And it did not interfere with my vision or capability to land at all. Now, do you want to talk about how it was on the surface, Ed?

MITCHELL I think it was substantially as previous crews have reported it, as far as working on the surface is concerned. It's a nuisance. The material is soft. It clings very readily to equipment, to suits, and it's a nuisance, but surprisingly, we didn't find that we had too much of it in the LM with us in the evening starting on the first night nor did we feel we carried too much of it back in with us after the second EVA. Except for the fact that it had impregnated the top of the suits and was on most other pieces of cloth. However, it came off of the metal very readily and that didn't cause any problem. I think it was more of a nuisance then anything else.

ROOSA Okay, as far as - after the docking and on the way back, the dust problem's really been non existant. They - of course Al and Ed took their suits off in the LM and then we have a vacumm cleaner in the command module, in which I passed over, and they vacuumed the suits. And I passed over several bags in which they put all of the equipment that they brought from the lunar surface, into these bags. They have zippers on them and so forth to keep the fine dust in. So I took each one of their suits and put it in a special suit bag that we have in here and another bag that they came back across and by holding a little positive pressure in the command module, we've had very little dust, and absolutely no problem at all.

SHEPARD I might just add, too, that we certainly have benefited from the lessons of earlier flights in this respect. I think the problem, particularly on Apollo 12 showed us how to handle the dust problem and I think that we have most of the answers now solved.

CAPCOM Now we'd like you tell us about the rocks you're bring back. How big are they? How big are they? What is their texture, color and did they crumble? And compare them with the rocks on Apollo 11 and 12.

SHEPARD Well, I tell you. We've been so busy we really haven't looked at the rocks. Stu's going to see if he can find one for us now. But while he is digging to comment on that particular question, of course we don't have the equipment here to analyze these rocks from the standpoint of mineral content and how they compare with the various mineral percentages with those brought back, but with respect to size. We didn't have a dust problem

SHEPARD until just now. With respect to size, I think the largest one we brought back was about a foot in its diameter, and the large rocks we've brought back were not crumbly. Some of the rock specimens, the smaller hand samples, which we collected, were in fact, crumbly, but the large rocks we brought back, I think we have 4 or 5 relatively large rocks. And these are not of the crumbling type. I think we just - we're faced with a different sort of a problem which just now has been created. I think we'll have to hold on showing you a rock until we get back.

CAPCOM Okay.

ROOSA I don't want to get a rock out.

CAPCOM The next question is for Al Shepard. Was the terrain in the landing area different from what you expected and describe your reaction to landing on a slope.

SHEPARD No, with respect to the general terrain, it was exactly as we had expected. As a matter of fact, as soon as the vehicle pitched over in the final stages of the landing approach, and we were able to recognize where we were and could control the spacecraft accordingly, we were essentially right on target, and we landed essentially right on target. I had originally planned to land a little bit to the south of the designated spot within a couple hundred yards because I thought it was smoother there. It turned out that there really was no smooth place in the general area of the landing site. As far as slope was concerned, there was something like 7 degrees slope, and it didn't give us any problem at all. The LM landed very softly, gently. No tendency for it to topple over, and it stayed there steady as a rock for the duration of the stay.

CAPCOM This next question is for each of you. As Space Pilots, what is your dominant professional impression of the flight?

ROOSA Well, I guess any comment like that - the answer that I'd give would be that to me it's gone - it's been very gratifying and I think it's been a challenge. I think each one of us has certainly had the chance to use his abilities as a research pilot and a scientist, and I think it's gone real well up to this point. And before we elaborate too much on a post mission conference, I'd rather wait till after reentry.

MITCHELL I think Stu's put it very well. The small things we've had to encounter that were unexpected have been handled very well by the entire team

END OF TAPE

ED - - have been handled very well by the entire team. I think everyone on the team functioned very well, certainly from our point of view. And all the major objectives that we went after were accomplished, at least well backed up so that we accomplished the per se or not. In my opinion, the mission was, to this point, quite a success. And I expect the re-entry to be quite a success.

SHEPARD I would only add to these comments that we're basically sensible people. That we're involved in a program of developing and promoting technology. Apollo 12 is only one step in the space technology. I feel that Apollo 12 - Apollo 14, I should say has been a resounding success and I don't really think that we've been able to assess at this stage what the contributions will be, but I can intuitively tell from what we've done, what we've seen on the surface that we're bringing back a lot of imformation photographically and geologically, that we've left stations and other stations on the moon sending back information for scientific purposes and I think that generally speaking, that it was a smashing success.

CAPCOM Again, for each of you. What event in the flight touched you most emotionally?

SHEPARD Well, I think the big emotion for me is yet to come, and that's getting both feet on the carrier.

ROOSA Okay, I'd say up to - there's been a lot of rather tremendous sights on the mission so far and entry will be another one, but I guess the first look at the moon after you - after you burn LOI and in the darkness and you come around, pitch to an attitude where you can see the moon and it's there below you at about 60 miles and it looks like about 200 feet. And your first impression of its body is a rather tremendous thing.

MITCHELL I think Stu's sight is my number 2 and my number 1 impact is when we pitched over and there was Cone Crater right out the window. It was very impressive.

CAPCOM You have not talked to your wives and families since you left Cape Kennedy, is there anything that you would like to say to them now? We'll make sure they hear about it.

SHEPARD Well, thank you. I'm sure you all have done a wonderful job of keeping them posted particularly with the communications and everything and I guess perhaps they're probably as well informed of the flight as we are ourselves, but (garble) don't know. We're all very well, very happy, and say hello and we'll look forward to seeing them in a few days. Ed.

MITCHELL - - nothing much after that at all.

ROOSA No, No. We'll be in touch.

CAPCOM The next question is for Al. Would you give us your personal feelings about the differences between the rides on Freedom 7 a decade ago and Apollo 14?

SHEPARD One big step. It's very difficult to - of course as the question implies, discuss the technical differences between the two flights. And standpoint of personal differences, I think that for those days, that the Mercury Redstone flight was just as much of an individual challenge as has been Apollo 14. I think, of course, the machinery are different, but the men with whom we worked, the individuals that helped us along, are pretty much the same and therefore the emotions are pretty much the same. They both were a great thrill for me, there's no question about that.

CAPCOM The final question is also for Al. You became the first Lunar Golfer with your little 6 iron. How many golf balls did you hit, how far did they go, and did you make the green?

SHEPARD Well, you saw the whole action on television. I missed the first one. The second one went perhaps a couple of hundred yards and the third one perhaps about 400 yards, which was not bad for a 6 iron.

MITCHELL Let me add, there wasn't any greens in site.

SHEPARD There were no green rocks, there were no green rocks.

CAPCOM Thank you very much. We've certainly enjoyed every minute of your commentary and this concludes the list of questions that we have for you. Thanks again.

SHEPARD Thank you and we'll look forward to seeing you shortly.

MITCHELL That's affirmative.

END OF TAPE

CAPCOM Apollo 14, Houston.

SC Go ahead.

CAPCOM This attitude will be a good one to hold through the P52, over.

SC Okay, is it also a good attitude for probe storage?

CAPCOM It's also a good attitude for probe storage?

SC How was the quality of the picture on that television transmission, Houston?

CAPCOM It was a very good picture, in fact our estimate is that it was as good as it's been at any time during the flight.

SC Okay.

CAPCOM Apollo 14, Houston. When ever you're ready we'll press on with the probe storage, and at this time you can go ahead and take the TV monitor, the monitor cable, power cable, cable bracket and stow all that in the bravo 1, wrapping the monitor in a CWG, over.

SC Okay, in work.

SC Okay, Houston, we're - we have the monitor and cable and brackets in B 1 and we're just touching up the cover for the probe vent right now, be back with you shortly.

CAPCOM Roger, we're standing by.

SC Say Houston, I think we have the probe head pretty well protected with that (garble) and I think we're ready to press on.

CAPCOM 14, this is Houston. The next step is an initial fitting of the probe into its stowage location. We'd like you to place the probe between the A6 and A10 lockers with a pitch arm down towards the Aft bulk head between A6 and A10, and the apex, that is the probe head towards A12, the base end of the probe with the flight data file book on it should be touching the right hand equipment bay panel. The probe should be oriented so that the yellow support arm touches the top or plus x side of the A6 locker, and it should be resting on 5 points which I'll read off to you after you get its position, over.

SC Hey Bruce.

CAPCOM Go ahead Stu, you're very weak.

SC Hey Bruce you said the hatch - what's the orientation of the hatches -

CAPCOM Okay, the yellow one is on the top side, or the plus x side of the A6 locker and then there's a pitch arm pointed down toward the aft bulk head between A6 and A10, over.

SC Okay, tell us how it's supposed to look now.

CAPCOM Okay, it should be resting on 5 points. The probe head should be on the A10 locker, or somewhere above it.

SC Okay.

CAPCOM There should be a support arm touching the plus Y side of the A10 locker.

SC Okay.

CAPCOM The yellow support arm should be touching the top or plus x side of A6.

SC Okay.

CAPCOM The base of the probe, with the flight data file lunar land mark book should be firmly up against the right hand equipment bay wall. Over.

SC Okay.

CAPCOM And there should be a sharp strip touching the plus y edge of the A10 locker, over.

SC Okay, Bruce it doesn't look like we can have the installation strap touching A6, and the shock strap touching the top of A10 at the same time.

CAPCOM Okay, in the next step, we're going to shim at 5 locations, and 1 of the places where we're going to shim is underneath the yellow support arm on top of A6, so if it's very close to the top that'll be satisfactory.

SC Okay, I think we see your point. This means that you actually do not have a shock strap touching the aft bulk head.

CAPCOM That's affirmative the shock strap is not touching Aft bulk head.

SC Or at least the cable line which is on top of the Aft bulk head at this point.

CAPCOM Roger, I think it's the pitch arm you're referring to and that's correct it is not comming into contact with the Aft bulk head yet, over.

SC Okay.

CAPCOM Al, we should have the shock strut which is attached to the support arm for insulation of the probe assembly in the hatch resting on the plus y edge of the A10 locker, over.

SC Okay, Bruce, the way we've got this probe now, it's making contact with the probe hand on A10 and it's up against the side bulk head and then the support strap that goes down to the support arm is on, is touching A10, those are the only 3 points right now that we have any contact. Now does that sound like we're in the right spot?

CAPCOM Roger it does. What you're calling the support arm is what we've been calling the shock strut, over.

SC Okay, to make sure we have our semanitcs right, we've got support arms and pitch beams, is that right?

CAPCOM Roger, we've got support arms and pitch arms, or pitch beams and the support arms are connected to the little shock straps, over.

SC Okay, so I think we're now in the position your describing, and we have a space between the LO installation

SC strud and A6, and a space between the pitch arm and the top of alo.

CAPCOM Roger.

CAPCOM Okay, now then we want you to locate on the command module the following locations where we intend to place shims. First is on the aft bulk head, underneath the pitch arm that is thrusting down towards the aft bulk head but is not in contact with it. At this location we intend to put in a bumper. It will not be a solid shim but it will serve to spread out any force should the pitch arm come into contact with the Aft bulk head, over. We'll put one flight data file book that you do not require for entry down there and, when we refer to flight data file books here, you can of course use LM books as well as command module books, it's your preference, over.

SC Okay.

CAPCOM Okay. The next location is on the right hand, or plus y side of A10, where the support arm comes close to touching on the side of the A10 locker or where it may actually touch depending on the precise location you've got there. We'd like a thin flight data file book in that place.

SC Yeah, we figure it'll be about 2 inches of padding there, but we see the point you're talking about.

CAPCOM We're talking about the face of the A10 locker that's over toward the right hand equipment bay paneling. Are you talking about the same place?

SC Right, plus y side.

CAPCOM Roger. Okay it sounds like we've got the right location there. Another place is where the probe head touches A10 and where the pitch arm comes over A10. We'd like to shim up on both those locations.

SC Okay.

END OF TAPE

CAPCOM at both those locations.
SC Okay, we've got 1, 2, 3, 4, 5 locations.
CAPCOM Okay and the fifth location, of course, is where the yellow support arm passes over the top of A6. In all of those locations, except the first one, that is the aft bulkhead underneath the pitch arm, we'd like to shim with unused publications such that the probe is firmly in contact with the underlying structure. And you may recall earlier this afternoon that I referred to use of the sleeping bag and window shade cover on the aft bulkhead, we've modified that stowage, and deleted the requirement for the window shade so you can use them for a good nights sleep. Over.
SC Very good. We understand.
CAPCOM Okay, at this juncture, if you have the contents of the shims in mind and the locations in place. Go ahead and remove the probe and tape the shims in place with the tape you have from R6. Over.
CAPCOM And as you go along. We'd be interested in knowing which books go in which location. Over.
SC Okay. Would you also like to know which page they're opened?
CAPCOM Negative. That doesn't matter. And you can delete our request for books.
SC Okay. Thank you.
SC Houston, 14.
CAPCOM Go ahead, 14.
SC Okay, Bruce. I just want to make sure that we've got it clarified. Tell me again what you mean when you say the probe is fully folded.
CAPCOM Stand by a minute. We're coming up on a site handover. I'll give you a call as soon as we reacquire. Over.
SC Okay.
PAO This is Apollo Control.
CAPCOM 14, this is Houston. Over.
SC Go ahead.
CAPCOM Okay, Stu. If you'll look at the yellow installation arm. About half way down its length, if the probe is fully collapsed, then this arm should be bearing against a teflon block that's part of the ratchet handle housing, there. Over.
SC Okay. The teflon block is not bearing against that. It's against the ratchet pawl, I believe is what it's going to come in contact with. So how do I get it there?
CAPCOM Okay, you've got about, probably 1 or 2 clicks left on the ratchet, and you should be able to extend it there by the normal procedures. I'll give you a talk through if you like.

SC Okay, stand by 1.

SC Hey, Stu, aren't you glad you got a couple knot tying swabbies onboard for this job?

SC Yes. How about that.

CAPCOM 14, this is Houston. How are you coming? Over.

SC Well, we're getting close now. We have the probe fully folded, and we're in the shimming process.

CAPCOM Roger.

END OF TAPE

CAPCOM Apollo 14, this is Houston, stand by for a mark on 100 000 miles from the earth. Over.

SC Okay.

CAPCOM Stand by.

CAPCOM Mark 100 000 miles.

SC Beautiful, beautiful. Getting closer all the time.

SC Okay. We're all in shape and ready for the next step, Houston.

CAPCOM Okay, the next step is to put the probe back in place and verify that it contacts the shims as required and the other hard points. Over.

SC Okay. We verify that.

CAPCOM Okay.

CAPCOM Using the double rope from the A6 anchor tie that to the apex of the pitch arm which points in the plus X direction making the rope as tight as possible.

SC Okay. That's complete.

CAPCOM Okay with the three rope combination from the other foot pad on A6 we want you to tie that also to the apex of the plus X pitch arm cinching it up tightly and try not to use too much line in this knot because it's going to go on from there down to the tied down point in the side of A10 directly beneath it. Over.

CAPCOM But don't tie it to A10 -

SC Okay, I think.

SC Just a loop to the fitting up against that tip of the apex and pitch arm should do it, huh?

CAPCOM Okay, a loop with maybe a 1/2 inch in it or something like that.

SC All righty.

CAPCOM And if Ed or Stu could get out the tools foxtrot whiskey and one we'll be ready for the next step when you're ready.

SC Okay Bruce. Now we're running that rope across through the hook on the outboard side of A8. Is that - or is it the one on A10?

CAPCOM No. It's going to be going to A10 but before you tie it down there, we'd like to disassemble one of the support arm shock strut assemblies at one point. Over.

SC Okay. We'll be standing by to tie down - soon as we get the tool kit up.

CAPCOM That it?

SC Houston, what tools do you think we need now?

CAPCOM Foxtrot, the crescent wrench, whiskey, the racket driver and one which is a socket. Over.

CAPCOM Now what we're planning on doing is on the support arm that points in the - diagonically in the plus X minus Z direction, we want you to remove the bolt at the joint between the support arm and the shock strut with FW and 1 and then you're going to put the bolt back in the hole of the support arm reinstalling that finger tight on that. Over.

SC Okay. Well that's in work.

CAPCOM And of course the reason for doing this is to get it out of the couch stroke envelope.

SC Rog.

SC Did you say you want the bolt - put that back in the shock strut?

CAPCOM That's affirmative.

SC Okay.

CAPCOM Al, this is Houston. Make that in the support arm part. Over.

SC Okay.

SC Okay, that is done.

CAPCOM Okay. Now using some of the LM webbing, we'd like you to tie the support arm and the shock strut against the body of the probe to keep it from flapping. Over.

SC Okay.

CAPCOM Apollo 14, this is Houston. We'd like to get oxygen tank 3 heaters to OFF now. L, 2, AUTO. Over.

SC 3 OFF, 1 and 2 AUTO. Okay.

CAPCOM Roger, that's 1 and 2 AUTO. Over.

CAPCOM 14, Houston. Confirm oxygen tank 3 heaters OFF. Over.

SC Okay. We've got oxygen tank heater number 3 OFF. O-F-F. We have oxygen tank heaters number 1 and number 2 AUTO. A-U-T-O.

CAPCOM Roger, 14.

SC Okay, Houston. That step is complete now. The webbing has been used to tie down the support arm.

CAPCOM Roger. Understand you've got the support arm and the shock strut tied down against the probe and the bolts back in the hole, the support arm, and are ready to press on with the lashing down. Over.

SC Rog. I suppose the next step is to tighten up the line going down to the A10 island.

SC Okay. That triple rope combination that came from A6 and was looped or tied around the apex of the plus X pointing pitch arm, then goes down to the plus Z plus Y D ring on the A-10 locker tied there, and then up to the apex of the pitch arm which points in the minus Z direction and from there it's going to go down to the minus Z plus Y D-ring on A10. Would you take that a step at a time if you like.

SC Okay. This is the first rope you're talking about now that comes up to the apex into the pitch arm - Then goes down through the tie down and A10.

CAPCOM Right.

SC (Garble)

CAPCOM And then it comes up to the apex of the pitch arm which points in the minus Z direction and then back down to the other tie ring on the side of A10. You're going to wind up with a rope that would look sort of M shaped when viewed from the side. Over.

SC Okay. Rope number one is tied in M as in Minneapolis, Minnesota.

CAPCOM Roger, Al. And that rope number one is the triple rope combination. Is that correct?

SC That's the first of the (garble) agreements.

CAPCOM Say again, please.

SC That's the first party of the tri part tied agreements.

CAPCOM Okay. Then the other two parties have to follow suit also. Over.

SC Okay. All three follow same path, huh?

CAPCOM That's affirmative.

CAPCOM 14, this is Houston. If one of you is free we'd like to start the VERB 49 maneuver to the optic calibration attitude now. Over.

SC Okay, Houston. We'll get it going.

PAO This is Apollo Control 196 hours, 43 minutes ground elapsed time. At the front of the Mission Control room here is a bouquet of red roses sitting on a table beneath the U.S. flag which is mounted on a replica of the lunar surface flagstaff and on the wall next to it, a replica of the Apollo 11 lunar module plaque "We came in peace for all mankind". This bouquet of roses has become a tradition during missions starting back with Apollo 8, the roses have been delivered - sent some time during the mission and there's always a card with a brief message and signed by a young lady named Cindy Diane - last name unknown from Montreal, Canada. The Apollo 14 bouquet of roses was delivered about an hour ago to the Control Room and accepted by Flight Director Gerry Griffin. The crew of Apollo 14 still lashing down the probe assembly and the cabin so it won't rattle around during entry. Spacecraft now 98 306 nautical miles out from earth. Velocity continuing to build up 5682 feet per second. Still up and live on Apollo 14 - -

END OF TAPE

PAO - - still up and live on Apollo 14 air to ground communications. This is Apollo Control.

SC Okay, Houston. That's complete we have a triple pass now as described (garble).

CAPCOM Okay. Now taking the fifth and last rope, we'd like you to double it and tie one end of it to the minus Z plus Y footpad of the A5 locker. You'll then loop it around the probe head and tie it to the minus Y plus Z D ring on A10. Over.

SC Okay.

SC Do you want this doubled or singled?

CAPCOM That'll be a double strand. You can just double the rope up and you can tie the bight of it around the minus Z plus Y footpad of A5 and go on with the double strand from there.

SC Okay. Very good.

SC Okay, Houston. That step's complete.

CAPCOM Okay, 14. That brings us to the end of the famous Apollo 14 probe storage for the re-entry procedure. Who did the least work on stowing this? We'd like a quality control inspection, please.

SC Everybody did 33 and 1/3 percent. You'll have to call 21 Nancy in on this.

CAPCOM Roger. 21 Nancy. And the only outstanding items from this afternoons efforts then are the final tieing down of the 30 pound decontamination bag with contents on top of A13, the 20 pound bag on top of A8 and the CMP's PGA was helmet on top of the 20 pound bag and then verifying 4 inches of clearance under the couch. We'll check with you on that tomorrow.

SC Okay. We've got that.

CAPCOM Okay. That takes care of tieing down and I'm going to hand over to Gordon here and you can press on with the optics calibration and the - I guess you've got to get the P - the optics calibration and flight plan as normal. Over.

SC Okay. Thank you very much. We're - that's a good storage procedure, it's tight as can be here.

SC We ought not to have any problems at all.

CAPCOM And you're in a suitable attitude to run the P52 also which you probably ought to do prior to starting in the P23. Over.

SC Rog.

CAPCOM Al, this is Houston. Over.

SC Go ahead.

CAPCOM Al, if you have time, take about a couple of minutes here, because I have a fairly lengthy question here reguarding a circuit breaker configuration yesterday during the DTO. Is this a good time to do it?

SC Okay. I'm not saying that we can remember, but give us the question and we'll take a wack at it.

CAPCOM Okay. At the start of the high flow portion of the DTO, Bruce was on and he read up to you the Poly 02 tag 3 50 watt circuit breaker, heater circuit breaker. And you rogered and we checked the transcript, but this call was made about an hour prior to actually starting the high flow and then later after I came on during the low flow part of the DTO, I called you went on a tank three heater cycle, the heater temp hit the upper limit and we asked for the heater switch off. We asked you to check and you confirmed that the tag 3 50 watt breaker was in and you must have missed it earlier. The problem is that the engineers are analysing the data from the whole DTO and not sure where the circuit breaker was during the entire period of the DTO and it really doesn't matter whether the circuit breaker was in or out as long as we know where it was during the test. Can you tell us the history of the position of the breaker during the high flow portion - was it ever pulled prior to my call on the temperature going at a limit and if so when was it pulled and when did it get put back in? Over.

SC Okay. This is Ed. I probably have the story better than anybody and I'm not sure I have it. It was pulled when it was called to be pulled and Al and I both remember that and it was noticed that it was back in shortly before you called and ask about it. I was over - oh, when I did the 02 - when I closed the 02 iso off the battery switch, I saw at that time that the 51 heater was in and I vagely remembered it should be out and yet it was in and that's when it was noticed. When it went in, I don't know. It was definitely pulled on call and I was surprised to find it back in and I reconfigured after the test, and you called us shortly after that.

CAPCOM Okay, Ed. If you'd stand by a minute, I'll see if they have any further questions to clarify.

CAPCOM Ed. Since we really have no further specific questions, just - unless you could maybe make a best guess as to whether that breaker was in or out during the high flow portion of the DTO.

SC Well, we started the high flow portion shortly after the time it was full, did we not?

CAPCOM I think I checked on that and they figure it was about an hour actually of time gap in there.

SC Alright. Just a minute. We're talking here.

SC Let us take a look at the flight plan here and see if I can refresh my memory a little bit.

CAPCOM Okay, Ed. Don't spend an excessive amount of time on it, but if you think you can remember anythink more about it we'd appreciate it.

SC Houston, Apollo 14.

CAPCOM Go ahead, Ed.

SC Okay, Gordon, in reviewing the - all the events that seemed to have taken place as per flight plan about that time, it was open as the first item at 167 hours, I believe. (garble) as far as I can tell no one was in that particular area or had any work in that area to tell when we terminated the test an hour or so later. And my best guess as to which probably closed inadvertently by myself or by one of the other two guys probably by myself about the time that we were starting the circuit breakers for the end of the test. I noticed it at that point, but I don't actually know when it was closed.

CAPCOM Okay, Ed. I think that's - that's good for our purposes. Thank you.

SC Okay.

SC Houston, 14.

CAPCOM Go ahead, Ed.

SC Now that we're talking about it, it is suppose to be open, now, is it not?

CAPCOM That's affirmative, Ed. And your previous estimate of the timeline there on the circuit breaker tags up real well with the data the engineers are pretty sure that that's exactly what happened.

SC Okay.

CAPCOM If you have your flight plan still in hand, I've got a short update for page 270.

SC Stand by.

END OF TAPE

SC Okay, go ahead.

CAPCOM Okay, on the sixth or seventh line down from the top, where it gives the darkside photo attitude of 122, 270 and 0. Change 122 to 125. And the high gain angles that follow are still okay. Over.

SC Okay, 125 and minus 59 and 90.

CAPCOM That's affirmative. And then when the rates, when you damp the rates there, as for PTC procedure, we'll give you a GO when the rates are good for taking the photos.

SC Okay.

CAPCOM That's it. Thank You.

SC Houston, 14.

CAPCOM 14, Houston. Go ahead.

SC Because of our bug with the probe, it appears as though - what we're going to do on this 23 is to skip the constraint stars and just mark on the first 3, and then go directly from there to the darkside attitude. I still expect to be maybe 10 or 15 minutes late on that. Does that pose any problem to you all if we do that way?

CAPCOM Stand by 1, Al.

CAPCOM That sounds like a good plan to us, Al. And there is no real time criticality on the earthside dim-line photography. Over.

SC Okay. Good enough. We'll do it that way then.

CAPCOM Roger.

CAPCOM Apollo 14, Houston.

SC Go ahead.

CAPCOM The analyst for the P23 would like to see you to shoot star number 4 also. Just the 1 star of the 3 constraint stars. They're using that as a trend star and this permits them to tie the data between the other P23's and to this one a little better. There's no problem being late with the darkside photography. Over.

SC Okay. Sounds good.

PAO This is Apollo Control. 195 42 ground elapsed time. Very little conversation coming down from the spacecraft at the present time. The crew is involved in the earth darkside dimlight photography. 95 019 miles out from the earth approaching at a velocity of 5816 feet per second. Live and listening on air-to-ground. This is Apollo Control.

CAPCOM Apollo 14, Houston.

SC Go ahead, Houston.

CAPCOM Ed, if you'll pass along to Stu. We noticed earlier today that he incorporated into the state vector the sightings on the constraint stars on earlier

CAPCOM batches. We'd like to ask that he not incorporate his fourth star tonight into the state vector. Over.

SC Okay.

SC Houston, 14.

CAPCOM Okay, Stu. Go ahead.

SC Okay, Gordon. These backup alinements over here at 198. As far as I know there's no DTO or anything else associated with those. They were just put in because I wanted to try those. Why don't you talk it over and consider about deleting those.

capcom Okay, I'll check on that.

CAPCOM Stu, this is Houston. It's strictly your choice. Over.

SC Okay. I think I'll delete those this evening. It'll put us just about back on time for the rest period.

CAPCOM Roger.

CAPCOM Apollo 14, Houston. I have a short update to the dimlight information.

SC Stand by 1.

CAPCOM Apollo 14, Houston. The update I have directs the inflow to be loaded in the P22 there. Over. Okay, just under the landmark coordinates, change the longitude over to from minus 17.5 to minus 25.000. Over.

SC Okay. Longitude over to minus 25.000.

CAPCOM That's affirmative.

CAPCOM Stu, this is Houston. G&C reports or rates look good. Take those photos when you get to them.

SC Okay.

CAPCOM Stu, Houston. A reminder to disable all the jets.

SC Roger, Gordon. You know I'm looking at this attitude we are right over a big trunnion, and it looks like there's a lot of glare. I suppose the sextant will be alright. It shoots by it, but I was wondering why the attitude was such where we had this large trunnion?

CAPCOM Stand by. I'll have to get an answer on that one.

SC I'll go ahead and shoot it, but it's so far over that I can't really see any of the earth crescent through the telescope.

CAPCOM Roger.

CAPCOM Stu, in answer to your question. Stand by.

CAPCOM Stu, in answer to your question, the attitude is designed for some maximum shading from the sun on the optics, if possible. And we wonder if you have looked through the sextant to verify that they are boresighted on the earths darkside. Over.

SC Well, yes it is. We still got that same scattered light problem, which we discussed on the way out, but it's off the terminator, sure enough, so if everybody is agreeable, we'll shoot it here.

CAPCOM That's affirmative. They concur. They expected some scattered light and they'd like to go ahead and take the pictures as shown in the flight plan.

SC Okay.

SC Houston, 14. We've completed darkside photography now. We're going to start PTC.

CAPCOM Roger, Al. And one item on - for the Surgeon here. He noticed after the probe stowage exercise, your EKG data and Ed's CPN data degraded to useless actually. We'd like you to check your external leads and Ed to check his EPN leads and also where Ed's leads go into the transmitter box.

SC Okay.

SC Okay, Gordo.

END OF TAPE

SC How does the CDR look now, Houston?
CAPCOM Al, yours looks good now.
SC Okay, one of my leads has a stripped thread so, it may or may not hold. Just keep me advised and I'll tighten up from time to time.
CAPCOM Okay, thank you.
SC Houston, 14.
CAPCOM Go ahead.
SC Hey Gordon, I don't want to make a big point out of it, but I just got an education on this P23 here. I've been noticing you know, except for when we shot the burn and we dropped that difference between the vectors down to about 30 miles, it's been running rather consistently, 50 to 55 to 60. Do the P23 specialists, is that the way they think it should be working?
CAPCOM Stand by, we'll get you an answer. Stu, the answer to the question is yes. That's the way they think it ought to work.
SC Okay, very good.
SC Houston, 14.
CAPCOM Go ahead.
SC Okay, would you like to copy the command module RCS samples?
CAPCOM Rog, go ahead.
SC Okay, systems test meter reading 5C 4.6, 5dog 4.6 6 malfunctions 4.4, 6 bravo 4.6, 6 charlie, 4.5 6 dog 4.5.
CAPCOM Okay, Stu, we got all of those.
SC Okay.
CAPCOM Apollo 14, Houston.
SC Go ahead.
CAPCOM We're at a good attitude. We're also configured to take the presleep e mod at any time.
SC Okay, we'll spin up here shortly and we'll give you a 74 right now.
CAPCOM Roger.
SC You've got it.
CAPCOM 14, Houston.
SC Go ahead.
CAPCOM The attitude I was referring to is for getting the dump. I think that we'd just like to remind you to be sure to complete most of your dumps before spinning up. There's no hurry to go into PTC if you want to just sit in that attitude, there's no thermal problems, over.
SC Oh okay, I misunderstood you.

END OF TAPE

PAO This is Apollo Control. 199:55 ground elapsed time. 10 hour sleep period - Beg your pardon. 8 hour sleep period scheduled to begin at 200 hours. The crew should be in the evening meal at this time, pass their onboard readouts, set up PTC. They actually should have set up the other spinup for PTC prior to this time. However, there will be some final adjustments to be made in conjunction with the ground to make sure it settles down to the proper rotation rate. The spacecraft is now 87 414 nautical miles out from Earth, approaching ever increasing velocity, now 6142 feet per second. This will increase to 36 170 at - by the time they reach 400 000 feet tomorrow afternoon. At 199 hours 56 minutes still alive and well on air-ground, this is Apollo Control.

CAPCOM Apollo 14, Houston.

SC Go ahead, Houston.

CAPCOM 14, this is gold flight. Before you guys sign off for tonight, on behalf of all the guys on the gold team that have worked during this mission, we want to tip our hat to you for a super job and we're looking forward to you getting back here to the ranch and we'll talk about it over a cool one.

SC We thank you, Gerry. Al's not on the loop right now. We'll pass that on to him. But we sure appreciate the support. Yall really do good work.

CAPCOM Well, thank you very much. We enjoyed it.

SC Gerry, your guys really did a super job on PDI day. That was wonderful.

CAPCOM Yes. We'll have to get together with the LM guys. Of course, they've already secured in their operation. But I agree with you. They and all their support people really hung in there and got up the answers that we needed.

SC They sure did. It was a great show.

SC Hey, hang loose for a minute Gerry. Al's getting on a headset here.

SC Gerry.

CAPCOM Go ahead.

SC You caught me right in the middle of a drink of cocoa.

CAPCOM Sorry about that.

SC Yall about to leave right now, huh?

CAPCOM Well, we'll be on for a few more hours, but this is our last shift and then the orange team is going to pick it up and you'll have maroon for entry.

SC Well, we'll be talking to you indirectly in a few days. I sure do want to thank you for that superb job you did for us. Especially down there around those low

SC altitudes. Everything went real fine and we appreciate your persistence that I know you had in getting that job done right. It's a hell of a thrill for us to work with, you, Ger.

CAPCOM Yes. We had a real ball at it. We'll be looking forward to getting that cool one when you get back here.

SC Sounds good, Gerry. Give our thanks to all the troups.

CAPCOM Okay. Will go.

SC Houston, 14.

CAPCOM Go ahead, 14.

CAPCOM 14, Houston. Go ahead.

SC Houston, do you read? 14.

CAPCOM Rog. You're loud and clear now, Stu.

SC Okay. Do our rates still look good enough for spinup?

CAPCOM That's affirmative. Rates are GO.

SC Oops. I just felt a thruster fire. Maybe we'll just set here for a minute. You take a look at it.

CAPCOM That was a roll jets. It shouldn't hurt anything.

SC Okay.

CAPCOM And on the comm you can go straight to OMNI mode. And the checklist here, select OMNI Bravo and mark the high gain at minus 52 pitch and plus 270 yaw. Over.

SC Okay, Gordon. We'll do it.

CAPCOM A couple of other items before we bid you goodnight. Your - Ed, your CPN has showed no change so far if you've had any chance to look at it. And we'd like to suggest you CPN data.

SC Okay. (garbled)'

CAPCOM The other procedure we'd like to suggest upon awakening in the morning that will improve your L over D slightly. We'd like to ask you to close the portable tank inlet valve and that will divert the water you use after you wake up to the waste tank and let the portable tank decrease which will give us a hair better L over D and I guess every little bit helps. Over.

SC Okay. We understand.

CAPCOM Okay. That's to be done in the morning not now.

SC Rog. Understand.

CAPCOM And of course, it will - -

SC Gordon, have you heard Ed. Have you heard an L over D figure being kicked around, Gordon?

CAPCOM Let me get one for you, Stu.

CAPCOM If you turn that tank valve off just before you start using water for breakfast, you should end up with an L over D just shy of .28. Over.

SC Okay. Copy .28 if we do the water bit.

CAPCOM Okay. And I think the only thing remaining is the onboard readout. Standing by any time.

SC Okay. Bat C is 37.0, 57.3, 37.3. Get the RCS in a second. 58 for quad delta, 57 quad Charlie, 55 quad Baker, and 59 quad able.

CAPCOM Roger, Stu. We copy all those.

END OF TAPE

APOLLO 14 MISSION COMMENTARY, 2/8/71, GET 200:40, CST 23:01, 581/1

PAO This is Apollo Control at 200 hours 40 minutes ground elapsed time. With that last exchange of onboard readouts, apparently the crew has closed up shop for the evening. The communications engineer reports to the flight director that the crew has shut off the voice switch and the communications system aboard the spacecraft. So, apparently, they plan no more calls back to mission control tonight. The spacecraft is now 84,754 nautical miles out, approaching at a velocity of 6,265 feet per second. We'll take down the air-to-ground circuit at this time. At 200 hours 41 minutes ground elapsed time, this is Apollo Control.

END OF TAPE

APOLLO 14 MISSION COMMENTARY 2/8/71 23:44CST 201:21GET MC-582/1

PAO This is Apollo Control 201 hours 21 minutes ground elapsed time. No word from the spacecraft in the last hour. They've shut down their transmitter switch and are settled down in passive thermal control or barbeque roll for the night. Here in the control room workmen are respacing the plaques from previous missions along the upper right wall in the control room in preparation for tomorrows spashdown when it's a tradition for the flight director to climb up a tall step ladder and hang the plaque from the mission just completed. And right now Apollo 14 is 82 236 nautical miles out from Earth approaching at a velocity of 6387 feet per second. And at 201 hours 22 minutes ground elapsed time, this is Apollo Control.

END OF TAPE

APOLLO 14 MISSION COMMENTARY, 2/9/71 202:12 GET 583/1

PAO This is Apollo Control at 202 hours 12 minutes ground elapsed time. According to the Flight surgeon the crew of Apollo 14 is soundly asleep at this time. Anticipating a shift handover in about an hour here in the Control Center to the Orange Team of flight controllers headed up by Pete Frank. Apollo 14 79 109 nautical miles out from Earth. Velocity increasing, now 6545 feet per second. 202 hours 12 minutes ground elapsed time, this is Apollo Control out.

END OF TAPE

PAO This is Apollo Control Houston at 203 hours 12 minutes ground elapsed time. Our displays at Mission Control presently show Apollo 14 at a distance of 75 308 nautical miles away from the earth and now traveling at a velocity of 6 749 feet per second. The crew of Apollo 14 of course, in their rest period as they have been for some time. Meanwhile in Mission Control, the orange team of flight controllers are now manning their positions. Flight director Pete Frank, presently going around the room at this time checking on status with each member of his flight control team. The atmosphere at this time in the control center is quiet, subdued and planning ahead for the entry activities, now some 13 hours 14 minutes away. We're at 203 hours and 13 minutes ground elapsed time and this is Apollo Control Houston.

END OF TAPE

APOLLO 14 MISSION COMMENTARY 2/9/71 2:35CST 204:12GET MC-585/1

PAO This is Apollo Control Houston at 204 hours 12 minutes ground elapsed time. Apollo 14 is presently 71 370 nautical miles away from the Earth and traveling at a speed of 6974.6 feet per second. The crew of Apollo 14 continuing with their rest period. Our clock shows 3 hours 47 minutes remaining. Meanwhile, the report from weather on what may be expected in the primary recovery area is particularly comforting. We show cloud cover of 2000 feet scattered to broken, 10 miles visibility, winds from an easterly direction 100 degrees at a velocity of 17 knots, sea state of 4 feet - 4 foot waves. On our entry plots we show a range from entry to splash of 1220 nautical miles and with a predicted point of splash at 172 degrees 39 minutes west, 27 degrees 1 minute south. We're at 2 hours - 204 hours 13 minutes ground elapsed time and this is Apollo Control Houston.

END OF TAPE

PAO This is Apollo Control, Houston, at 205 hours 12 minutes ground elapsed time. Our display in mission control presently shows the spacecraft, Apollo 14, at a distance of 67,278 nautical miles out from Earth, and now traveling at a speed of 7,225 feet per second. Very little activity in the mission control center during the past hour. In addition to monitoring Apollo 14 spacecraft systems, members of the orange flight control team also had the opportunity to watch a rerun of last night's televised crew news conference from space. We're at 205 minutes 13 minutes ground elapsed time, and out clock shows 2 hours 47 minutes from time of crew wake-up. This is Apollo Control, Houston.

END OF TAPE

APOLLO 14 MISSION COMMENTARY, 2/9/71 206:12 GET 587/1

PAO This is Apollo Control Houston at 206 hours 12 minutes ground elapsed time. Apollo 14 now at a distance of 63 068 nautical miles away from the Earth, now traveling at a velocity of 7508 feet per second. We show 1 hours 47 minutes until time of crew wakeup. Ten hours 15 minutes until time of reentry into the Earths' atmosphere. We're presently logging an entry interface time of 216 hours 27 minutes 47 seconds. From entry on in in terms of retro elapse time of preliminary numbers now showing on one of our displays at the console, we show reaching 05g at plus 29 seconds. Blackout should begin shortly before that at plus 18 seconds. Blackout ending at 3 minutes 36 seconds. Droque deployment, drogue shoot deployment at 8 hours - or 8 minutes 3 seconds. Main shoot deployment 8 minutes 51 seconds. And, this would give a landing for Apollo 14 at 13 minutes 48 seconds. These numbers, of course, will be refined and updated as Apollo 14 continues on its path toward the Earth. We're at 206 hours 14 minutes ground elapsed time, and this is Apollo Control Houston.

END OF TAPE

PAO This is Apollo Control, Houston, at 207 hours 14 minutes ground elapsed time. We're some 45 minutes away now according to our clock from that time at which the crew of Apollo 14 will be wakened - awakened. Meanwhile, in the Mission Control Center, a decision has not yet been made as to whether or not midcourse correction number 7 will be performed. Flight director Pete Frank expects this decision to be made at about 210 hours ground elapsed time. About 7 hours ago the science staff support room in the Mission Control Center observed and recorded some activity on the passive seismic instruments for the Apollo 12 and 14 experiments. We presently show Apollo 14 at a distance of 58 444 nautical miles away from Earth and traveling at a velocity of 7845 feet per second. We're at 207 hours 15 minutes ground elapsed time and this is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control Houston at 207 hours and 59 minutes ground elapsed time. We presently show Apollo 14 at a distance of 55 100 nautical miles away from the earth and traveling now at a speed of 8 113 feet per second. The crew of Apollo 14 should be receiving their wake up call shortly. Our CAPCOM for today or for this shift is Astronaut Fred Haise. Haise will be the individual in the Control Center making that call. At 208 hours ground elapsed time, standing by continuing to monitor, this is Apollo Control Houston.

CAPCOM Apollo 14, Houston.

SC This is Apollo 14. Good morning, Fred-O.

CAPCOM Good morning, Ed. Down the home stretch show you're about 55 grand out now. I got a few things here for you if you got a flight plan handy.

SC Okay. Let me get some lights on first, Fred.

CAPCOM Okay.

PAO That's Ed Mitchell who responded to the call.

SC Okay, Fred-O, go ahead with your updates.

CAPCOM Okay, first we got a consummables update; g.e.t. of 208 hours; 44.0, quad A 44.9, B 41.0, C 45.7, and D 44.4. H2 tank 01, 30.7 and two, 29.2. O2 tank one 63.3 two, 65.0 3 is 10.9 and why don't you go ahead with that readback, if you want, Ed, first.

SC Okay. 208.09 44 on totals; quads, 44.9, 41 0, 45 7, 44 4. Hydrogen one, 30.7, two 29.2. Oxygen one, 63.3 two, 65.0 and 10.9.

CAPCOM Okay. Standby one.

CAPCOM Okay, 14, how do you read now? We had to get the (garble) off the line.

SC Okay. (garble)

CAPCOM Yeh, you're good now. Right to the left of the consummables update block, there's a VERB 29 maneuver to the optics cal attitude to at about 208 30 and your high gain angles there should be PITCH minus 73, and the YAW number there should be 102.

SC Okay. That's corrected, thank you. 102.

CAPCOM Okay, and let's see, we'd like the potty tank inlet valve to CLOSE so we can get a little more water into the waste tank.

SC Okay, I'll do that right now.

CAPCOM And, 14, Houston. You still on?

SC That's affirm and the potty tank's closed off.

CAPCOM Okay, Ed, let's see they'd like here the readout that you have there on the onboard PITCH and YAW's X-band meters.

CAPCOM And also the dials.

SC Okay, at this moment you mean?

CAPCOM That's affirm, Ed.

SC It looks like at this moment they're at 160 and 360. The thumb wheels are sitting at minus 52 and 270.

CAPCOM Okay, sounds good.

PAO Apollo Control Houston 208 hours and 9 minutes ground elapsed time. Our readout on the onboard computer shows that Apollo 14 is now having a platform, computer platform alinement underway per the flight plan. We presently show 14 at a distance of 64 247 nautical miles away from the earth traveling -

SC Go ahead, Fred.

CAPCOM Okay, we've got that number 3 tank down low enough so here after just in case you're wondering we'll keep tanks OP tanks 1 and 2 in AUTO and we'll leave tank number 3 OFF.

SC Okay. That's my current configuration and I understand it will stay that way.

CAPCOM Roger, Ed. And we've got the torque angles okay.

SC Okay.

PAO 208 hours, 11 minutes -

SC 14, one other note here they missed - says they missed getting a presleep medication report and from that I assume you didn't have any medication as such is that correct?

SC That's a good assumption.

CAPCOM Okay. 14 I've got one other thing which concerns verifying where you've got some stowage and it's not too time critical so if you want to go ahead and get cleaned up first and just give me a call when you want to talk about that.

SC Okay. Got anything else outstanding we owe you, Fredo?

CAPCOM No, I think we've got everything taken care of except finding out for sure where you got all the bags.

SC Well okay, right now we don't have them all, but we don't have them all stowed but we know exactly where we're going to put them and we'll be starting that before long.

CAPCOM Okay.

PAO Apollo Control, Houston, 208 hours, 13 minutes ground elapsed time. Apollo 14 now traveling 8202 feet per second, now at a distance of 54,028 nautical miles away from the Earth. We'll stand by continuing to monitor.

END OF TAPE

SC Houston, 14. Fredo, did you get the NOUN 93's pertaining to the (garble)?
CAPCOM That's affirmed 14. We got those.
SC Okay, and the time, we are using is 281105.
CAPCOM Roger. 28, 11:05.
SC Houston, 14.
CAPCOM Go ahead, 14.
SC Okay. Post sleep report. On sleep Al and Stu have 4 hours each. I had 6. The PRD, Al is 16062, Ed is 07060.
CAPCOM Okay. Copied sleep report, or post sleep report 4 4 and 6 hours. You get the 6 and I copied the other notices (garble).
SC Rog. Now there's one on the headset, too.
PAO That's Ed Mitchell reporting that Al Shepard, Stu Roosa both have a 4-hour sleep while he got 6 hours sleep.
SC Go ahead.
CAPCOM Ed, tell Stu I watched the press conference and I hope he didn't let all the lunar fines out there.
SC He did a pretty good job on letting part of them.
CAPCOM Yeah, I could see that.
SC We've got it all picked up now though.
CAPCOM Okay.
SC We don't have any dust in there Fred, you can see that.
CAPCOM And, 14, Houston. We'd like the high gain cranked up when you get out of bed.
SC Okay, Fredo, I'll stand by one.
PAO Apollo Control, Houston, at 208 hours and 28 minutes. A read out of Apollo 14's computer shows it in program 23. Stu Roosa -
SC Got her, Fredo.
CAPCOM Okay. Thank you.
PAO Stu Roosa apparently performing the cislunar navigation program, that's his midcourse navigation. 208 hours and 29 minutes Apollo 14 52 756 nautical miles away from earth, velocity 8314 feet per second. 208 hours 33 minutes ground elapsed time, taking a look at the onboard display key board, Apollo 14 continuing in program 23, doing midcourse navigation by incorporation of the star/earth and star/moon optical measurements. 208 hours 34 minutes, 52 375 nautical miles away from earth, Apollo 14 traveling at 8347 feet per second. This is Apollo Control, Houston.
PAO Apollo Control, Houston, 209 hours 03 minutes ground elapsed time. We presently show Apollo 14

PAO at 50 014 nautical miles away from the earth, traveling at a speed of 8564 feet per second. We've had no conversation with the crew of Apollo 14 recently. However, our ground displays of the onboard computer show that program 23, the midcourse navigation program, is still in progress. We're at 209 hours 04 minutes. This is Apollo Control, Houston.

CAPCOM Not bad, Stu.

SC Well, I'm not sure whether it's good or bad, Fred. I think we probably need some updates. That doesn't help me much.

CAPCOM Al Day, Al, Dave here says you're looking pretty close, or maybe it's like the old saying even the blind squirrel find a nut now and then.

SC Say, you're just all heart this morning, Fredo.

PAO That's our CAPCOM, Fred Haise, critiquing the -

CAPCOM Over confidence.

PAO - critiquing the midcourse navigation program. The Dave referred to is Dave Reed here in Mission Control. Dave is a Flight Dynamics officer.

CAPCOM And, Stu, Dave wonders if you want to proceed from here maybe and look at the Delta V's in P-37 and he'll compare with you.

SC Okay. We might try thet depending on the time here; still a little stowage I want to get on.

CAPCOM Okay.

PAO Stu Roosa aboard Apollo 14 as command module pilot. He has been performing the P-23 into the computer. We're at 209 hours 09 minutes ground elapsed time. Apollo 14 49 541 nautical miles away from the earth, traveling now at a speed of 8611 feet per second. This is Apollo Control, Houston.

END OF TAPE

CAPCOM 14, Houston.

SC Go ahead.

CAPCOM Hey, just thought Stu would be interested, after last sets of marks there, we have a scanner now down to about .05 degrees, and altitude against stars about four tenths of a mile.

SC Stu will get a little bit better on the marks.

PAO Apollo - Apollo Control Houston. 209 hours 34 minutes ground elapsed time. We presently show 14 at a distance of 47 493 nautical miles away from the earth. Velocity now reading 8813 feet per second. At present we are looking for a decision or GO/NO GO for the midcourse correction number seven. At 209 hours - 210 hours 30 minutes, ground elapsed time. This is Apollo Control Houston.

END OF TAPE

SC Houston, 14.

CAPCOM Go ahead 14.

SC Fred-0, we're starting into getting these bags stowed in here. You said you had a storage update for us. (GARBLE) can we have it.

CAPCOM I'm not sure it's an update Ed. You may have already gotten the word, but there was a conflict in a note that retro had on one of them, and it indicated that maybe you had put it in a different spot. And - -

SC I don't know which one you're referring to, but go ahead and let's hear it.

CAPCOM Okay, I'll just read, theres only 3 items, 3 items, and one says that the 30 lb bag will be put on A13. The 20 lb bag on A8 and Stu's suit with the helmet and a sleeping bag will be on top of the, also on top of A8.

SC Okay, stand by just a minute. Fred-0 we were putting the 20 pounder on A8 with the suit on top of it, now is that the way you want it now?

CAPCOM That's correct.

SC Okay, that's the way we are going.

CAPCOM Very good.

CAPCOM 14, Houston.

SC Go ahead Houston.

CAPCOM Okay, Ed. Would you verify the H2 fans off.

SC Stand by Fred-0. Okay, they're off now.

CAPCOM Roger, Ed.

CAPCOM 14, Houston.

SC Go ahead Fred-0.

CAPCOM Okay, ya'll can crank the carousel up there anytime, and before you do, we'd like you to check the S-band pitch nob at minus 40 yaw at 90, react and we'd like the medium beam right now.

SC Okay, you want minus 40 90 react and we're ready to spin up.

CAPCOM Okay, and that was medium beam with that.

SC Rog, medium beam with it.

PAO Apollo Control Houston. 210 hours 5 minutes ground elapsed time. Apollo 14 now 44 832 nautical miles away from the earth. Now traveling at a speed of 9000 - 9100 feet per second. In his last conversation with Apollo 14, Fred Haise advised Ed Mitchell the lunar module pilot that Apollo 14 could proceed with their manuever to a passive thermal control latitude. We are at 210 hours 6 minutes ground elapsed time continuing to monitor. This is Apollo Control Houston.

END OF TAPE

COMM TECH Honeysuckle COMM TECH, Houston COMM TECH, NET 1.

HONEYSUCKLE Honeysuckle.

COMM TECH Roger. You loud and clear, how me?

HONEYSUCKLE Loud and clear also.

COMM TECH Thank you.

PAO This is Apollo Control, Houston at 210 hours, 24 minutes ground elapsed time. At present we show Apollo 14 43,200 nautical miles away from Earth, velocity now reads 9276 feet per second.

CAPCOM 14, Houston.

SC Go ahead, Houston.

CAPCOM Okay, we won't be needing MCC-7.

SC Roger, said no MCC-7, no MC-7, thank you Fredo.

PAO Apollo Control, Houston. That was CAPCOM Fred Haise advising Apollo 14 that Midcourse Correction 7 will not be required. We're presently looking at entry angle of 6.38 degrees. The present coordinants for splash 27. - 27 degrees .02 minutes South, 172 degrees, 40 minutes West. Velocity at time of entry interface is presently seen as 36,170 feet per second and range to go from entry interface, 1225 nautical miles. The MAX G expected, 6-1/4. We're at 210 hours, 36 minutes ground elapsed time. We now show Apollo 14 at 42,302 nautical miles from Earth and traveling at a velocity of 9391 feet per second. This is Apollo Control, Houston.

END OF TAPE

SC Houston, Apollo 14.
CAPCOM Go ahead, 14.
SC Okay. Let me give you the command module RCS ejector valve tips.
CAPCOM Okay, go ahead, Ed.
SC Okay, this one is the test meter 5 Charlie 4.4, 5 Delta 5.1, 6 Alpha 4.5, Bravo 4.4, Koko 4.4, and Delta 4.5.
CAPCOM Okay, we've got them, Ed.
PAO This is Apollo Control, Houston at 210 hours 47 minutes ground elapsed time. We presently show Apollo 14 at a distance of 41 209 nautical miles away from earth and traveling at a velocity of 9512 feet per second. At 1402 Greenwich mean time, it was the first observation of the Mission Control Center was made of what later turned out to be the effects of the Los Angeles earthquake. Stations at Honeysuckle, Hawaii, Guam, and Carnarvon had communications affected. We lost various combinations of voice and data circuit for periods ranging from 1 minute to as much as 5 minutes. However, by using data from alternate stations, and the alternate stations in this case, Honeysuckle and Carnarvon, the Mission Control Center was never without full capability. These circuits have been either cleared or rerouted by the telephone company and Mission Control Center, Houston is now in normal capability. We are at 210 hours 48 minutes and this is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control at 210 hours 58 minutes. In Mission Control at this time we're completing the shift handover. Flight Director Milton Windler and his Maroon Team of Flight Controllers is replacing the Orange Team headed by Flight Director, Pete Frank. At the present time Flight Director is reviewing the mission status with each of his flight controllers, that's before coming on shift this morning. The Maroon Team met in one of the staff support rooms here to review all of the procedures which will be followed during entry both for a normal entry into a number of contingency situations which could conceivably arise, and at the present time Apollo 14 is 40 126 nautical miles from earth. The velocity of the spacecraft up now to 9647 feet per second. There will be no change of shift briefing this morning.

PAO This is Apollo Control at 211 hours 10 minutes. Our Flight Director, Milton Windler has completed his status review with flight controllers here in the control center, and everything appears to be in good shape. for today's entry. The network controller reports that the - all of our ground length circuits around Los Angeles have been by-passed, we are - we do have alternates circuits around Los Angeles and at the present time I have full primary capabilities and the network controller reports that we do have some loss of back-up circuits but that all of our prime circuits are functioning at this time. A midcourse correction seven has been dropped there will be no midcourse correction at - at midcourse opportunity which was to have occurred about 213 hours 27 minutes. This will give the crew a bit of added time will also allow us to get some of the update to them a bit earlier. Normally, until the last updates such as landing coordinate, and so on, are not passed up until after we've obtained some tracking following that midcourse correction. Without performing the mid course, of course the Flight Dynamics Officer, Return-to-Earth Officers, tracking data does not have to be updated, and they'll be able to get such things as the entry pass up to the crew a bit earlier than normal. We're currently showing Apollo 14 at an altitude of 38 936 nautical miles The velocity up now to 9800 feet per second.

END OF TAPE

SC Houston, Apollo 14

CAPCOM Go ahead 14, over.

SC Hello Bruce. Say, I thought I'd try to make the surgeon happy for the last 4 or 5 hours in the flight. Have him check my biomed now please.

CAPCOM Roger Ed. Understand you would like a biomed earnest integrity and telemetry check, over.

SC That's affrimative.

CAPCOM Okay, we'll get them going on it.

CAPCOM Apollo 14, this is Houston. The surgeon reports they have good data on all crewmen, with the exception of Ed's respiration rate. The ZPN censors are still not getting through on telemetry, however, don't worry about it at this time. They are happy with what they have got and medically you are go for entry, over.

SC Okay, well, I just replaced one censor that had come lose and I thought maybe that was the one causing the problem.

CAPCOM Okay, right now we're not getting your respiration rate. Which one did you -

SC Okay, stand by just a minute.

CAPCOM Which one did you replace Ed?

SC Actually I replaced the top outer, not on the stern, the one to the right.

CAPCOM Okay, understand the upper one on the right side of your chest, not on the stern over.

SC That's affirm. Stand by on the respiration here, and let me see if I can press them and get them coming in. Yea, you tell them to watch it now.

CAPCOM Okay, they're watching. All right.

CAPCOM And 14, this is Houston, when you select OMNI Charlie, would you give us a call so that we can send you command reset over.

SC Okay, I was just getting ready to do that when you called. It's going in now.

CAPCOM Roger, thank you.

CAPCOM 14, Ed, this is Houston, over.

SC Go ahead Houston.

CAPCOM We have seen no change in your in feeding memograph. We suspect that it may be a problem in the signal conditioner, and the surgeons thank you for you efferts in attempting to restore the actuarial leads but suggest that you just leave it as is for entry, and not bother with it any further, over.

SC Okay, I was pulling and tugging and I am convinced the sensors and harness is okay, Bruce, so I agree with you, it must be some where down stream.

CAPCOM Roger, the feeling is that it's probly in the signal conditioner.

SC Okay, tell them not to worry, I'll hold my breath and then they'll know what the rate is.

CAPCOM Say, that sounds like a pretty good plan. Give us a mark when you start holding and then we'll time from there.

SC Okay.

CAPCOM either that, or the surgeons say that if you give us a mark when you start holding your breath, we'll give you a mark when the EKG goes flat, over.

SC That's a fair enough exchange.

CAPCOM 14, Houston, the information that you that you sent us down on the systems test meter leaves us to cancel the command module RCS predeed, as you probably surmised by now. We just wanted to make sure we were both on the same frequency, over.

SC Okay, we concur. Thank you Bruce, over.

CAPCOM 14, Stu, this is Houston.

SC Go ahead.

CAPCOM Roger, in looking that you Noun 49 values, we're scratching our heads on the magnitude of the DELTA R and DELTA V updates. Would you verify that the first star you were in fact, using the far horizon, and on this one you are using the near horizon, over.

SC That's affirmative. I worried about that to at the size of them, Bruce, and I verify that this one for sure on the near horizon, and you know I'm 99 per cent certain on the other one. I really didn't, I reshot and got that same large update, and thought it was pretty good, but I didn't see them taper down like they should have. I'm mistified also.

CAPCOM Okay, over. Not meaning to, to trend backseat drive, we're trying to figure it out for you also, and we wanted to confirm that before we went too much further, over.

SC Okay.

END OF TAPE

CAPCOM Apollo 14, this is Houston, I have your reentry pad whenever you're ready to copy. Over.

SC Okay, Houston. Ready to copy.

CAPCOM All right. Roger. And would you confirm that star 23 was loaded in P23 this time, it looked like 22 as it went by us.

SC Roger, it was 22, Bruce. I went back on to check that first star again, and I'm afraid that is the trouble I shot the wrong horizon on the star 22. And, Bruce, would you suggest that I shoot that over again? See if we can take that error out.

CAPCOM Stu, this is Houston. Go ahead and shoot star 22 over again and we'll have some more detail word for you on the sequence after that in a minute.

SC Okay.

CAPCOM And after reshooting star 22, Stu, you can press on to star 23, and there's no need to redo 64. Over.

SC Okay.

CAPCOM And, Ed, if you're ready, I've got the entry pad.

SC Okay. Let's copy.

CAPCOM Roger. Entry, mid Pacific area, ROLL at .05G, 000 154, 000 216 1047 267 minus 2702 minus 17265, MAX G, 062 36170 639 11402 36251 our RT 216 2747 0029, NOUN 69 is NA DO 400 0209 0018 0333 0807, Sextant star, 30 3543 307, Borsight star, Nuhydra, up 211, left 28, uplift vector, comments. 1, use nonexit EMS pattern. 2, moon check, moon in left of window. ROLL 000 182 000. 3, moonset GET 216 plus 25 plus 15. RET of 90,000 feet, 6 plus 29 main deploy 8 plus 54, landing 13 plus 52. Constant G entry is ROLL right. GDC aline 322 325 018 and for your information the MSFN values of gamma at entry interface are minus 6.39 comparing with the navigated value prior to this last set of P23's of minus 6.42. The MSFN vacuum perigee 20.6. Your onboard vacuum perigee 20.1. And back under GDC aline it's Sirius and Rigel for the stars. Readback. Over.

SC Okay, Bruce, we have a mid Pac landing at 0 - ROLL, PITCH and YAW, 000 154 000 216 1047 267 minus 2702 minus 17265, max G to 062 36170 639 11402 36251 216 2747 0029, D sub 0 is 400 0209 0018 0333 0807, Sextant star, 30 354.3 307, Nuhydra, up 211, left 28, lift vector up, use nonexit EMS pattern. Okay, for the moon check attitude, it's at the left of the window, should be at ROLL 000 182 000 and moon data is at 216 25 15. RRG of 90K 629, main entry 54 landing 1352. For Constant G ROLL right. GDC aline stars are Sirius and Rigel, in angles of 322 325 018. The MSFN entry gamma is minus 6.39. My onboard camera 6.42. H sub B is 20.6 and 20.1.

CAPCOM Roger, 14. Readback correct. Out.

SC (GARBLE)

PAO This is Apollo Control at 211 hours, 54 minutes. At present time aboard Apollo 14 Command Module Pilot, Stu Roosa, is involved in midcourse navigation activity. Roosa is basically sighting the fixed line of sight of the spacecraft sextant on the Earth's horizon and centering the selected star in the movable line of sight of the sextant over the Earth's horizon and then taking a mark on this. The computer automatically reads the time and the angle between the star and the horizon, using this information to update the onboard knowledge of the spacecraft position and velocity. And, as you heard, in that last exchange between CAPCOM Bruce Mc Candless and Roosa prior to beginning this last set of navigation marks, the onboard readings were agreeing very closely with the ground computed values for such things as the angle of entry interface and the time of altitude of vacuum perigee. We've also passed up a preliminary set of numbers for entry to the crew. This will be updated probably about 1 hour prior to entry. We've seen very small changes in these numbers. A time of entry interface has remained unchanged, 216 hours, 27 minutes, 47 seconds. There have been some minor changes of a few seconds in some of the postentry events beginning a blackout and now occurs at the same time 216 hours, 28 minutes, 5 seconds. The end of blackout is 3 seconds earlier than the previous number, it's now 216 hours, 31 minutes, 20 seconds. Prior to the end of blackout, the spacecraft will enter the region of maximum G forces; this will be a maximum G of about 6.2. It will occur at about 216 hours, 29 minutes.

CAPCOM Apollo 14, this is Houston.

SC Go ahead, Houston.

CAPCOM After you have finished with this P23, Stu, we will uplift to you a new MSFN state vector for the CSM and load it into the LM state vector slot and leave it there until time to uplink you our final MSFN state vector which will come about - come after your last set of P23.

END OF TAPE

CAPCOM P23s, and for your information, in the event that we should have communications problems, the CSM state vector that we read up to you in the pad yesterday would be acceptable for conducting an entry. Over.

SC Okay.

PAO Some of our additional times in the entry sequence continuing on for drogue deploy at 216 hours 35 minutes 54 seconds, and deployment of the main parachute at 216 hours 34 - 36 minutes, 216 hours, 36 minutes 41 seconds, and flight change also on the splash down time. We're now showing 216 hours 41 minutes 39 seconds. And that splashdown time is showing a change of only about 4 seconds. We've now got splashdown occurring about 4 seconds later than on the previous set of numbers passed up to the crew. And we expect that these numbers will continue to change by small amounts in the information passed up to the crew one hour prior to entry which will be more than likely be the last update, we'll probably see some few seconds of change in these numbers. The angular entry interface is also showing a small change with added tracking, and it seems to be shifting more toward the center of the entry corridor. Since our last reading, that angle has changed by only one, one hundredth of a degree, by now reading negative six point three nine degrees of entry interface. The exact sum of the entry corridor would be 6.5 and the return-to-earth officer feels that the 6.39 is more than adequate. At 212 hours the Apollo 14 is traveling at a speed now of 10 454 feet per second. Nearly two miles per second. And the spacecraft altitude 34 323 nautical miles from earth. And at this time our large ten by twenty display board in the front of the control center is beginning to show the effects of the ever-increasing gravity on the spacecraft trajectory ground track. Beginning to curve southward now, it will eventually loop back on itself, sweeping up beneath Australia to the mid Pacific landing point south of Samoa. The recovery people report that the prime recovery ship, New Orleans is on station steaming around the recovery area, and then in a little more than one hour the first of two ARIA, Apollo range instrumented aircraft will leave from Samoa to be on station in the recovery area about one hundred miles north of the ground track. The weather in the recovery area is good, we have a wind of about 18 knots, out of the southeast, and wave heights of about five feet.

SC Houston.

CAPCOM 14, this is Houston.

SC Go ahead.

CAPCOM After Stu finishes his marks on this last star, we'd like him to standby for a possible rerun of star 22, in the present attitude and configuration, we

CAPCOM also have to do a ground tracking station handover here, and we'll do that after he finishes marking on this star and advise you. Over.

SC Understand.

END OF TAPE

CAPCOM 14, this is Houston. If you will give us POO and ACCEPT, we'd like to uplink to you a new CSM state vector for the LM slot, the desired orientation and entry (garble). Over.

SC You've got it.

CAPCOM Okay.

CAPCOM 14, this is Houston. We are finished with the uplink. The computer is yours. Our recommendation on the P23 sightings is that you return to star 22 and take additional marks until you're satisfied with the magnitude of the Delta-R - Delta-V updates, or until we start running shy on time. It looks now like we can slip the initial P52 you have scheduled at 212 hours down to about 213 hours since we have cancelled midcourse 7. Over.

SC Okay, Bruce, just keep shooting Star 22 only.

CAPCOM That's affirmative. The marks that you took that drove the state vector out, were those derived from Star 22 and I'm informed that the fastest way to bring your state vectors back in would be to put in compensatory marks from the same general direction. Over.

SC Okay. We'll give it a go.

CAPCOM 14, this is Houston. We show your computed value of vacuum perigee coming down into agreement with the MSFN value at the rate of about 2 miles or so per mark on star 22. Over.

SC Yeah, Bruce. The way I figure it, I've got about 16 marks to go.

CAPCOM Well, we were going to say 10 marks to go, but we thought you'd figure we were being sarcastic.

SC No, I'm looking at verb 83 and she's coming down about, well it was 30 miles down about 25 miles a mark. You know I could have already been through if I had a recycle on this program.

CAPCOM Okay, I'll tell the (garbled) boys about that.

PAO This is Apollo Control at 212 hours 48 minutes and we're now about 3 hours 53 minutes from splashdown, Apollo 14 traveling at a velocity now of 11 298 feet per second, 29 422 nautical miles from earth. Stu Roosa, aboard Apollo 14, is still involved in midcourse navigation using the onboard sextant and computer. At one point you heard a conversation between Roosa and Spacecraft Communicator Bruce McCandless referring to the fact that Roosa's marks taken at the time of the sighting appeared to be bringing the onboard readings into closer agreement with those we have here on the ground. At one point the difference between the onboard and the ground readings was extremely close. In taking the last set of marks, using, in this particular set of readings, a series of stars and the lunar far horizon, Roosa reported that he apparently on one star

PAO sighted along the near horizon of the moon rather than the far horizon, giving him an unusually large difference on that particular star. In his update the process now is to go back and remark on the same star a number of times to get the readings in agreement. The on-board navigation is used as a backup and would be available to the crew in the event we lost communications at some point in the return leg of the journey from the moon and were unable to pass to them the ground computed values which will be used as the prime source for entry. And among the readings that we're watching, as Roosa continues to take marks and bring his onboard state vector in closer agreement with the ground computed one, is the onboard measurement of the height of vacuum perigee. This is the computed altitude at which the spacecraft would pass earth if earth had no atmosphere, and of course what actually happens is that the earth's atmosphere captures the vehicle and slows it down for entry and parachute deployment. Without an atmosphere the computed value would show that the spacecraft would pass about 20 nautical miles from the surface of the earth and this is one of the figures that when the wrong lunar horizon was used onboard that we saw a change. It jumped up to about 80 nautical miles and it's coming down now with additional marks on the proper horizon to about 35 and we presume eventually will drop back down to a very close agreement with the 20 that we are computing here on the ground. Again repeating, this procedure is used as a backup in the event that communications did not permit us to give the ground computed numbers to the crew, and of course we've already gotten a preliminary set of numbers in for the entry and these would be adequate in the event that we were not able to give them the final pad, which will come probably about one hour prior to entry. At 212 hours 52 minutes, this is Apollo Control Houston standing by.

END OF TAPE

CAPCOM Apollo 14, this is Houston. Over.

SC Go ahead, Houston.

CAPCOM Stu, we're showing your calculations of vacuum purge, you're coming down only about one mile from MARK at the present time, we've got about 21 miles for the MSFN solution and about 53 for yours. We suggest that you terminate the P23 marking routines at this time and then press on for the flight plan. Over.

SC Okay, sounds like a good one.

CAPCOM 14, Houston. We copy your torquing angles.

SC Okay, and torquing is 212 5850. I suggest you give them a call on the (garble)

SC And -

CAPCOM 14, this is Houston. Before torquing to the entry REFSMMAT we recommend SCS and check your limit cycle switch on please. Over.

SC Okay.

CAPCOM Apollo 14, this is Houston. Apollo 14, this is Houston. Over.

SC Go ahead.

CAPCOM Okay 14, we hadn't planned on any sort of a complete or comprehensive news cast this morning, on your way to reentry, guess we figured you'd probably get a pretty good briefing after splashdown. There is one item I'd like to read up to you though, if you have a minute.

SC Okay, go ahead with that, and we'd also be interested in what the weather is in the recovery area when you finish.

CAPCOM Okay. The recovery area, the weather is about 1500 or 2000 scattered, higher broken, winds from 100 degrees at 15 knots, the waves are - are two sets, you've got a batch of two foot waves with a two second period, and super-imposed on them you have some four foot waves with a three second period and in general it looks pretty good Ed. Get some more details for you if you're interested. Over.

SC Well, that's pretty good, unless it changes from that measurably. It sounds like there's nothing bad at all.

CAPCOM Right. We'll have an update for you on the weather as you get closer to interface. This one is dateline Los Angeles. A powerful earthquake hit Southern California at 8:01 Central Standard Time today, causing two reported deaths, numerous injuries and cracked buildings and highways. The jolting tremor was felt over at least 350 miles from Fresno to below the Mexican border. The damage was worse in Los Angeles and its heavily populated San Fernando Valley. The center of the shock reported at 17 miles north of the valley in the rugged San Gabriel mountains. Major damage is reported in the two closest

CAPCOM towns of Newhall and Saugus 35 miles northwest of downtown L.A. The magnitude of the shock was rated at between 6 and 6.5 on the Ritcher scale, which rates major quakes at 7 or more. It was the strongest quake in Los Angeles area since the 1952 trembler at Tehachapi to the north which had the magnitude of 7.2 and was strongly felt in L.A. It killed 13 persons. The San Francisco earthquake was 8.25. Over.

SC Looks like San Andreas is kicking up again.

END OF TAPE

PAO This is Apollo Control at 213 hours 42 minutes. It's been relatively quiet here in mission control with everything progressing smoothly towards splashdown in about 3 hours. At the present time Apollo 14 is up to a velocity of 12 587 feet per second. And Apollo 14 now has 23 530 nautical miles to go. During the last hour before entry, we'll see a dramatic increase in the spacecraft velocity as the number jumps from about 18 000 feet per second to about 36 000 feet per second and at entry interface, we will expect the velocity to be reading about 36 170 feet per second. The guidance officer reported a short while ago that the crew now has the spacecraft in the proper attitude for the final set of star sightings, midcourse navigation, and we expect they'll probably be doing this a little bit ahead of the flight plan due to the fact that the final midcourse correction, midcourse correction 7 has been deleeted. Apollo 15 crewmen, commander Dav Scott, command module pilot Al Worden, and lunar module pilot Jim Irwin, in pressure suit assemblies will show news men and photographers equipment and experiments that will be flown on their flight later this year. The showing is scheduled to be held tomorrow, February 10, from 10 to 11 am in the Manned Spacecraft Center building number 5. Equipment on display will include a full size Apollo 15 lunar module mock-up, the 1 G lunar roving vehicle, and all the equipment associated with it. Also all the lunar surface gear, including the Apollo lunar surface experiment package, or ALSEP, the sample return contains, crew tools and associated equipment. They will also have the Apollo service module SIMBAY mock-up, along with the experiments which are in that bay. The gamma ray spectrometer, mass spectrometer, Alpha X-ray spectrometer, the sub satellites, the pan-camera, and the maping camera. During the deminstration the crew will be wearing their space suits minus the portable life support system, or back packs, and minus the helmets, but these items will be displayed in the area. That's the Apollo 15 crew, and again the showing will be tomorrow, February 10, at 10 to 11 am in building number 5 at the Manned Spacecraft Center.

CAPCOM 14, this is Houston. Whenever it is convenient with you, we would like to press on with the logic sequence check, and get that out of the way. And I understand that this 212 alarm is expected, as a consequence of the CMC self check.

SC Roger, we'll give you a buzz when we're ready to move out.

CAPCOM Roger.

END OF TAPE

SC Houston, the logic sequence is checked, we're standing by for seq logic on.

CAPCOM Let's stand by, please, 14.

CAPCOM 14, this is Houston. We show that the logic power is on at the present time. Over.

SC That's affirmative -

SC We're standing by at the present time.

SC We're standing by on the step seq logic 2 on up.

CAPCOM Okay. That's what we show as already having been accomplished. What is the position of your seq logic switches? Over.

SC Okay, they are on up. That was the computer, here. Okay, we're standing by for a call.

CAPCOM Roger. Ed, your system is in a good configuration. Do not arm the pyros at this time, however, you would be go if you had desired to. Over.

SC Roger.

PAO This is Apollo Control at 214 hours 11 minutes. We're now 2 hours 31 minutes away from splashdown. Everything is progressing smoothly at this time. Apollo 14 traveling at a velocity of 13 529 feet per second, and the spacecraft now 20 127 nautical miles from earth. Again, to go over the events during and just before the entry sequence, entry interface occurs at 216 hours 27 minutes 47 seconds. We expect that number could possibly change by a matter of a few seconds. The Flight Dynamics and return-to-earth officers have completed their final computations on entry, however, we would expect the change would be quite small. Again, the entry time 216 hours 27 minutes 47 seconds. Fifteen minutes prior to that the crew will jettison the service module, and they will do this by yawing the spacecraft 45 degrees and then jettisoning. This is to minimize any change of recontact of the two modules of the spacecraft during entry, we'll then return to the entry attitude and at 216 hours 28 minutes 05 seconds, or about 18 seconds after entry, they'll enter blackout. Blackout will last until 3 minutes 33 seconds after entry, and in the period of blackout at about 1 minute 25 seconds following entry, they'll experience maximum g forces, the max g load about 6.2. The drogue parachutes are scheduled to deploy at 216 hours 35 minutes 54 seconds, and about 47 seconds later, the three main chutes will come out. That will be at 216 hours 36 minutes 41 seconds, with splashdown scheduled to occur at 216 hours 41 minutes 39 seconds. And the latest splash coordinants. And again, no change in these since yesterday, will be 27 degrees 2 minutes south 172 degrees 40 minutes west, which will put the splashdown point some 10 miles west of the international date line. The recovery ship New Orleans is on station at this time and will be supplemented by five recovery helicopters, two rescue aircraft

PAO C-130's, and also two Apollo range instrumented aircraft standing by about 100 nautical miles north of the ground track. Again, repeating an earlier announcement, Apollo 15 crewmen, Commander Dave Scott, command module pilot, Al Wardin, and lunar module pilot Jim Irwin, and pressure garment assemblies will show newsmen and photographers equipment and experiments that will flown on their flight later this year. The showing will be held tomorrow, February 10, from 10 to 11 am at building 5 at the Manned Spacecraft Center. Equipment on display will include a full-size Apollo 15 lunar module mockup, the 1-g lunar loading vehicle, and all the equipment associated with it, and also will be all of the lunar service gear, including the Apollo lunar surface experiment package, the sample return containers, crew tools and associated equipment, and the equipment in the Apollo service module send bay mockup which includes the gamma ray spectrometer, mass spectrometer, alpha ray spectrometer, a subsattelite, the pan camera, and the mapping camera. The crew will be suited, they will be minus the portable life support systems for backpacks and helmets. These items will be displayed in the area. Again that is at 10 am in building 5 at the Manned Spacecraft Center tomorrow, February 10. At 214 hours 15 minutes, Apollo 14 is 19 608 nautical miles from earth, velocity 13 698 feet per second.

END OF TAPE

SC 8 minutes

CAPCOM 14, this is Houston. How do you read? Over.

SC Loud and clear, Houston.

CAPCOM Roger, reading you the same.

PAO This is Apollo Control at 214 hours 37 minutes. At the present time the crew on Apollo 14 is making the final alignment of their guidance platform. The stable number of the platform that will be used to attitude references on board the spacecraft during entry, and in the next hour and 50 minutes before they begin entry, the crew will be running an entry check, configuring their reaction control system, and running some checks on that system. They'll also be checking the entry monitoring system, and will then maneuver to a horizon check attitude prior to jettisoning the service module. The service module jettison will come about 15 minutes prior to entry. They will then maneuver back to entry attitude and a final position for earth entry. Entry to occur at ground elapsed time of 216 hours 27 minutes 47 seconds splashdown at 216 hours 41 minutes 39 seconds. At this time Apollo 14 is 16 671 nautical miles from earth. The velocity increasing evermore rapidly up now to 14 731 feet per second.

CAPCOM Torquing angles look good there Stu.

SC Okay. Okay Houston, we'll be torquing at 2.43845.

CAPCOM Roger, Al.

END OF TAPE

CAPCOM Apollo 14, this is Houston. Over. Apollo 14, this is Houston. Over.

SC Go ahead, Houston.

CAPCOM Roger 14, we'd like to conduct the VHF simplex alpha check at this time if one of you can support it. Over.

SC This is Apollo 14 on the VHF alpha, do you read?

CAPCOM Okay, Ed, we're reading you loud with a little bit of garble. I understand you've turned off your S-band TR and you are coming at us, VHF alpha is that correct? Over.

SC VHF coming at you final that time and came out VHF alpha.

CAPCOM Roger, standing by.

SC Houston, Apollo 14, how do you read VHF alpha?

CAPCOM Oh, loud and clear. VHF alpha Ed, how me?

SC You can cut it down a little bit, Bruce to readable.

CAPCOM Okay, we're still over an hour - more likely about an hour and 10 mintues out from the finally nominally conducted check and chart is showing you about 17,000 miles out so I think it's a pretty good check. Over.

SC (GARBLE)

CAPCOM Apollo 14, this is Houston. Over.

SC Go ahead Houston.

CAPCOM Okay, if you're interested I have an update on the weather for you. Over.

SC All right. Standby. Okay go ahead with your weather update.

PAO Roger, at your planned landing area the general condition is good. You've got 2,000 feet scattered, high broken and ten mile visibility. The wind is 120 degrees at 15. Wave height is 4 feet of the southerly swell 4 feet. The altimeter is 3006 or minus 128 foot pressure altitude. GMT computed for your landing is 2105 on the 9th, sunrise was at 1715 in the night. Sunset at 0 620 00 on the tenth, that's for your G&N target point and over at the constant G target point there is really no significant change between the order of the two places. Your recovery forces standing by are the landing platform helicopter, New Orleans, which is 5 miles from target point. Swim 1 and 2 SH3 helicopters in the vicinity of the target point and the ship Pontchatoula at the backup target point, it's an AO oiler. Other support, you've got photo 1 and relay 1 and SH3 helicopters in the vicinity of the target point that are providing photo and voice coverage and Samoa Rescue 1 and 2, HC 130's that are about 45 nauts away. Over.

SC Okay, Houston. I believe I got all of that and I hope to be in contact with the New Orleans very soon.

CAPCOM Roger.

SC And Houston, 14, the EMS checks out real fine.

CAPCOM Roger, Stu. Copy EMS entry check complete.

SC Tested.

CAPCOM 14 this is Houston, if you could give us POO in ACCEPT we have your final state vector uplink for you. Over.

SC Okay. Bruce, you've got it.

CAPCOM Roger.

CAPCOM 14, Houston we're through with the computer, the uplinks in and you've got a MSFN state vector in both slots. Over.

SC Rog. Thank you Bruce.

PAO This is Apollo Control at 215 hours, 11 minutes. A flight dynamics officer reported a short while ago that he had completed his final computations on spacecraft position and velocity. These are the numbers used by the return to Earth officer and his final computations of the entry and post entry event and we'll be passing those numbers up to the crew here in a matter of minutes. At the present Apollo 14 is 16,924 - rather traveling at a velocity of 16,924 feet per second and now 11,985 nautical miles from Earth. Weather in the recovery area remains good and we're moving steadily and smoothly towards entry in 1 hour, 15 minutes, 40 seconds with splashdown in approximately 1 hour, 30 minutes.

END OF TAPE

CAPCOM Apollo 14, this is Houston. Over.

SC Go ahead, Houston.

CAPCOM Okay, 14. I've got some changes to your entry pad. Over.

SC Okay, go ahead, Houston.

CAPCOM Okay. Under NOUN 60, gamma at 400 000 feet should be minus - should be 6.37 vice 6.39. I say again, 6.37. Over.

SC Understand, 6.37.

CAPCOM EMS range to go should be 11381. Over.

SC EMS range to go 11381.

CAPCOM Okay, time of V Circ is going to be 0210. Over.

SC V circ 0210.

CAPCOM Time for ending blackout 0335. Over.

SC End of blackout at 0335.

CAPCOM Drogues 0805. Over.

SC Drogues 0805.

CAPCOM 90 000 feet 6 plus 28, mains 8 plus 53, and landing 13 plus 51. That's knock one second off each of the last three. Over.

SC Understand, one second off the last three.

CAPCOM Roger.

SC Houston, 14. We are planning on activating the RCS's on minus one hour.

CAPCOM Say again, 14.

SC We're planning on activating the command module RCS at about minus one hour.

CAPCOM Roger, we copy.

SC Okay, Houston, the logic is on and we're standing by for a GO for pyro.

CAPCOM Roger, we see the logic ON and stand by, please.

CAPCOM Apollo 14, this is Houston. You are GO for pyro arm.

SC Rog 14, and we got both rings pressurized here.

CAPCOM Roger, 14.

CAPCOM Okay, both rings look good from down, 14.

SC Jolly good.

PAO This is Apollo Control at 215 hours 30 minutes. We're getting our final status checks in Mission Control now for entry, Apollo 14 traveling at 18 740 feet per second, 9276 nautical miles from earth.

CAPCOM Apollo 14, this is Houston. All your systems are looking good from down here and we're in great shape for the entry. The carrier is 5 miles off the target point, so you can go ahead and land right at the target point. Over.

SC They're up (garbled). Hope they get a good picture over.

SC Thank you for your kind words. Every thing looks good up here.

SC We are pressing on.

SC Houston, stand by for a thruster test ring 2.

CAPCOM Roger, we're standing by, Ed.

CAPCOM Okay, ring 2 looks good to us.

SC Okay.

PAO The crew at this time is performing the final status checks of the reaction control system thrusters. Shortly they will begin checking the logic and pyrotechnic devices used in separating the service module and in deploying their spacecraft parachutes.

SC Okay, Houston, they are both good to us.

CAPCOM 14, this is Houston. We concur, both rings checked out good on the ground here, and we'd like to hold to the timeline in the entry checklist as far as getting the batteries on on the remainder of the events. Over.

SC Okay, hold on the batteries then.

CAPCOM Roger.

PAO This is Apollo Control at 215 hours 37 minutes. We're coming up now on 51 minutes until entry. The final data passed to the crew shows entry interface to occur at 216 hours 27 minutes 47 seconds and that's no change from our previous figure. A couple of other figures have changed by a matter of one or two seconds. We will begin blackout at 216 hours 28 minutes 05 seconds or 18 seconds following entry interface. The blackout period will end 3 minutes 35 seconds following entry and at 8 minutes 5 seconds after entry we predict the drogue parachutes will be deployed. These are the two parachutes 16-1/2 foot diameter used to provide initial stabilization and breaking of the spacecraft in the earth's atmosphere, and at 8 minutes 53 seconds following entry the main parachutes will deploy with a splashdown predicted for 13 minutes 51 seconds following entry, at a ground elapsed time of 216 hours 41 minutes 38 seconds, and our predicted splash coordinants also remaining virtually unchanged, 27 degrees 1 minute south, 172 degrees 39 minutes west, which would be about 9 miles west of the international dateline, and local time would put the splash down on Wednesday, although of course in terms of Greenwich mean time or central standard time this splashdown time is unchanged. The spacecraft velocity approaching now the 20 000 foot per second mark and continuing to increase evermore rapidly, heading towards a velocity at entry of 36 170 feet per second. We're now 7892 nautical miles from earth.

END OF TAPE

PAO This is Apollo Control at 215 hours 57 minutes. We're coming up now 30 minutes until entry, and in the next few minutes the crew aboard Apollo 14 will be bringing their entry batteries on line, in preparation for seperation of the service module in about 15 minutes. Of course when the service module seperates the fuel cells, which are the primary source of electrial power during the bulk of the mission are also seperated. Batteries are used from that point on during entry. The crew will also be using, or be checking out the sequential and pyrotecnics systems used in deploying their spacecraft parachutes, before going to seperation attitude and seperating the service module and then finially back into the entry attitude. Apollo 14's velocity is now 2 000, 23 770 feet per second and we're 4568 nautical miles away from earth. Ecomm now reports the batteries are all on line. The recovery support room here in Mission Control reports that the prime recovery ship is on station and all support aircraft, the 5 helicopters and 4 fixed-wing aircraft, are airborne and on station at this time.

CAPCOM 14, for you information, Somoa rescue 1 and 2 are on station and helicopters are in the air.

SC Sounds good, Bruce.

END OF TAPE

PAO This is Apollo Control at 216 hours 5 minutes, we're getting a bit of noise on the circuit. As the crew maneuvers the spacecraft to the horizon check attitude. Checking the attitude prior to separation of the service module, and that about to occur in about 7 minutes. Apollo 14's velocity has now climbed to 24 042 feet per second, and the spacecraft is now 4393 nautical miles from earth. 21 minutes 45 seconds now until entry interface with splashdown to come in about 35 minutes 30 seconds. This is Apollo Control at 216 hours 10 minutes we're now coming up on about three minutes to service module separation. Spacecraft velocity is 24 042 feet per second and we'll see that velocity increase by about 12 000 feet per second in the next seventeen minutes. At entry interface we should be reading about 36 170 feet per second, and at entry the spacecraft will be about 1138 nautical miles from the splashdown point. Guidance officer reports the spacecraft is maneuvering now to the separation attitude, we'll standby for that event, scheduled to occur within the next minute or so. Spacecraft now in separation attitude yawed 45 degrees, from the normal entry attitude. This is to minimize any chance of recontact with the service module after separation.

SC Houston, (garble) standing by for fire one.

CAPCOM Go for fire one.

SC Okay, we have separation, Houston.

CAPCOM Roger.

PAO Al Shepard confirming that the service module has separated from the command module. They'll now reorient into the reentry attitude. And at this time - at this time we show Apollo 14 4393 nautical miles from earth, 24 042 feet per second velocity. This is Apollo Control at 216 hours 18 minutes, we're now reading the on-board display. The numbers that the crew is reading for entry velocity and range to go, and the computer shows them to be traveling at a velocity of 31 955 feet per second, continuing to increase. 4000 miles from splashdown.

CAPCOM Apollo 14, this is Houston. Over.

HOUSTON CONTACT Honeysuckle contact, Houston contact, net one contact.

HONEYSUCKLE Loud and clear.

HOUSTON CONTACT Roger, same here Honeysuckle.

HONEYSUCKLE Roger.

CAPCOM Apollo 14, Apollo 14, this is Houston. Say again, you're very weak. Over.

SC Okay Houston, we have had good separation, we're back in plane, following the horizon down. Over.

CAPCOM Roger, we copy you now loud and clear.

SC Okay.

CAPCOM And you're looking very good from down here 14.

SC Okay, everything's fine up here.

PAO Apollo 14 now 3200 miles from the splash point, velocity 33 805 feet per second. This is Apollo Control 4 minutes 45 seconds from entry and it's grown unusually quiet here in the control center. On board the spacecraft crew now reading 2800 miles until splashdown. Their velocity shows 34 465 feet per second.

CAPCOM 14, this is Houston, we show you at 98.4 Amp hours left on the water and 56 hours endurance. Over.

SC Okay, 98.4 and 56. Thank you.

CAPCOM Roger.

SC (garble) Houston.

CAPCOM Roger, Stu.

SC Yeah, that was the real moonglow.

CAPCOM Right about on time.

PAO This is Apollo Control -

CAPCOM And this is Houston, through Aria 2, how do you read? Over.

SC Loud and clear Houston.

CAPCOM Roger, reading you the same 14.

(garble)

CAPCOM Roger.

SC Our thanks to the Aria troops for the memento they sent before launch.

CAPCOM Okay, I'll pass it on to the rest of -

END OF TAPE

SC I'm sure some of them are monitoring the loop.

PAO This conversation coming to us through one of the Apollo range instrumented aircraft. Our velocity now showing 36 000 feet per second, 1500 miles from splashdown and we're 24 seconds from entry. We're now at the entry point and in about 18 seconds we should have blackout. That will last until about 3 minutes 35 seconds after entry.

CAPCOM Apollo 14, it's about 8 seconds to beginning of blackout we'll talk to you when you come out the other side. Over.

SC Okay, Bruce. Sounds good.

?? It's 2 seconds, now.

PAO And our retro office has just predicted that the target point will also be the splash point. We're coming up now on about 30 seconds until max g - maximum g force of about 6.2 g's. We're now at 1 minute 20 seconds after entry, about - coming up now on the maximum g forces - 6.2 g's at this time. And we're about 2 minutes from end of blackout. Our return-to-earth officer has just estimated that blackout will end about 1 second prior to the predicted time, at an elapsed time of 3 minutes 34 seconds after entry. That will be about 15 seconds from now. And we should have come out of blackout. We'll stand by for reestablishment of communications through the Apollo range instrumented aircraft. CAPCOM McCandless is putting in a call to the crew now.

END OF TAPE

CAPCOM We've still not acquired signal through the ARIA aircraft. Retro says our last data looked very good. It should be right on the splash point.

CAPCOM Apollo 14, Apollo 14, this is Houston through ARIA 3 how do you read? Over.

SC L4 , go ahead.

CAPCOM Okay, 14, you're coming in loud and a little bit of noise through ARIA 3. How did it go?

SC Pretty good here, we (garble)

SC Things are looking good, Bruce. CMS - CMC checking real well.

CAPCOM Good show, Stu, on television looks like a beautiful day out there in the recovery area.

CAPCOM 14, Houston. Samoa rescue 1 has S-band lock with you. Over.

SC Thank you.

SC We have 30 seconds before (GARBLE).

PAO We're now 7-1/2 minutes from splash, about 2 minutes - 1-1/2 minutes rather from drogue deploy.

CAPCOM Okay, 6 plus 2A 14. GARBLE.

SC Setting up -

CAPCOM Roger.

SC (Garble) Okay in NOUN 57 I read 2704, 17269 2704 17269 (garble)

CAPCOM Okay, we copy that 14. You're looking real good.

SC And the altimeters off the peg, as in 50 chambers.

CAPCOM Roger, passing 50.

PAO Those numbers read by Al Shepard indicate the spacecraft guidance system targeted for a precise splash-down. We should have drogue deploy shortly.

SC Drogues are out.

CAPCOM Okay, 14, copy drogue deploy and we'll turn you over to the recovery forces now. Have a happy landing.

SC Thank you.

PAO Standing by now for the 3 - 83 foot diameter ring sail main chutes to come out.

RECOVERY New Orleans.

RECOVERY 2 BRISBANE.

SPEAKER Relay group.

RECOVERY 1 (GARBLE) relay (GARBLE).

RECOVERy 2 North was 130 from the ship -

END OF TAPE

AIR BOSS - - from the ship approximately 5 miles. Line 2 relay on station over head. (garble) Roger (garble)

RECOVERY Apollo 14, Apollo 14, this is recovery, recovery, over.

(garble)

SC Roger Apollo.

RECOVERY Apollo 14, Apollo 14, this is recovery, recovery, over.

SC This is 14, we're hearing, reading you loud and clear.

SC I read you loud and clear, recovery.

RECOVERY Apollo 14, Apollo 14, this is recovery, recovery, recovery. We uphold you visually, reactivate recovery beacon, out.

SC Roger.

RECOVERY Recovery, New Orleans requests astronauts post report from Apollo 14, over.

RECOVERY Right, there, we would like - -

RECOVERY Apollo 14, Apollo 14, this is recovery, over.

AIR BOSS (garble) all three chutes look good, appear to be (garble)

SC Apollo Roger.

RECOVERY Apollo, this is recovery. Do you have any point transmission?

SC Negative, negative. Apollo 14, Apollo 14 auto over.

RECOVERY (garble)

RECOVERY Apollo 14, this is recovery over.

SC (garble)

(garble)

(garble)

RECOVERY Photo Roger.

SC and (garble) 1 4 8 radio at 4 and 1 half.

RECOVERY Roger, we hold you on radar.

SC Roger.

RECOVERY Apollo 14, Apollo 14, New Orleans over.

SC This is 14, read you loud and clear.

RECOVERY Roger, request crew status and position.

SC The crew is fine. We have completed the dump and the purge. We've run the check list and everybody's in good shape.

RECOVERY Roger, request position.

RECOVERY Apollo 14, New Orleans request computer read out.

SC Okay, Roger. We're 27 01 and 17266 2701 17266.

RECOVERY We copy.

SC And passing (garble)

RECOVERY Roger.

SC (garble)
RECOVERY Roger.
SC (garble)
RECOVERY Stand by to splash off (garble)
RECOVERY New Orleans, welcome home.
SC Thank you sir. We're stable one and everyones in good shape.
RECOVERY roger.
SC Two chutes detatched, one apparently is draped over the command module.
RECOVERY Rog. I think that's correct. We can see it through our window.
SC And auto's off plus one note.
AIR BOSS Read you Apollo.
SC Plus 2R3 and that's a midnight wrap-up.
AIR BOSS Rog. 1 2 (garble)

END OF TAPE

PHOTO And Photo coming up with second smoke drop (garbled) two moving up for grappling for the main chutes.

RECOVERY Photo from Recovery. If you can get through, request a crew condition after splashdown.

RECOVERY Roger, Apollo 14 report your crew condition. Over.

SC We're in good shape in here.

PHOTO Roger, did you copy, Recovery?

RECOVERY Negative, we got him very weak.

PHOTO Roger, they're in good shape.

SWIM THREE This is Swim Three. You're getting a little harsh. You've got the radar picture of the command module.

PHOTO ONE Photo one, one open (garbled) one chute. They've got the (garbled) operation on the main chute command module stable 1 riding easy on the seastate. Over.

PHOTO ONE New Orleans, Photo.

RECOVERY Roger, go ahead.

PHOTO ONE Roger, request permission to put swimmers in water when (garbled) Over.

RECOVERY Permission granted.

PHOTO ONE Rog.

PHOTO ONE And our grappling hook appears to be imbedded in one chute.

PHOTO ONE And Photo has visual on VHF antennas command module flashing light appears to be off.

PAO Swim One helicopter, piloted by Commander Paul K. Hine of Alhambra, California, has requested permission to put its swimmers in the water.

PHOTO Swim Two from Photo. One main chute, I believe, is too deep to get. The other one is remaining on the command module (garbled). Recommend you deploy swimmers.

PHOTO Swim two, Roger. (garbled)

RECOVERY Roger, you have permission to drop your swimmers in. Recommend dropping two swimmers due to the shroud lines and problems associated with that.

SPEAKER (garbled) standby position.

PHOTO Roger, request you look up wind for the swim one.

SWIM ONE Roger.

PAO Swim one requesting permission to drop two swimmers at this time to handle the parachute shroud lines which are in the water.

SWIM ONE Swimmer's in the water and has his thumbs up.

SWIM ONE Swimmers approaching the command module.

END OF TAPE

RECOVERY Swimmer has moved around the command module and has attached the sea anchor and is swimming up wind.

RECOVERY Apollo Recovery near by there.

PAO It appears that at least one of the three main parachute shroud lines did not detach from the command module; we can still see it attached. Normally those lines would be disconnected primarily to prevent the main parachutes from pulling the spacecraft into the Apex down or upside down attitude, but it does appear to be holding well in the stable one right side up attitude.

RECOVERY The anchor is extended to the full length aboard Apollo and is being deployed.

RECOVERY Main anchor appears to be deployed. Swimmer is returning to the command module now.

PAO And the swimmer reports that the sea anchor has been deployed; he'll be returning to the spacecraft.

RECOVERY Swimmer is back at the command module. Has come on the command module go ahead.

SC Negative; we have the information.

RECOVERY Swimmer is checking over to the command module swimming around it.

PAO Prior to attempting to attach the flotation collar, the procedure will be to cut the shroud lines separating the parachute from the spacecraft.

RECOVERY Number 2 swimmer is cutting the shroud lines to the main parachute. And the swimmer has cut about half the shroud lines to the main chute. Appears to be one remaining shroud.

PAO Swimmer now cutting the shroud lines attaching the parachute to the spacecraft. One shroud line still remaining.

RECOVERY Frogmen swimming back around to the down wind side of the command module. Frogman is signaling for a swimmer to (garble) for him. Swimmer two is in ready to position. Frogman 2 moving up for recovery. The swimmers are (garble) the flotation collar. There's only one flotation. Number two (garble) are ready for (garble). Flotation collar is at the command module. Got one (garble) collars. Bungy cord is being extended around the command module.

PAO The swimmer is now putting stretchable bungy cord around the base of the spacecraft prior to attaching the flotation collar.

RECOVERY He has it extended around the command module.

END OF TAPE

SC Bruce, would you get the collar baggers to help us.

SC And what was the reaccess, rechecking the GARBLE.

SC GARBLE.

SPEAKER All right. Roger. Up.

SPEAKER Okay.

SPEAKER Flotation collar baggers to help them.

SC Recovery, Apollo 14.

RECOVERY This is Recovery reading. Apollo 14, go ahead.

SC GARBLE I don't see any reason to inflate our bags. Do you agree?

RECOVERY This is Recovery? I agree. GARBLE you're waiting in the water and the collar should be on in about 11 minutes.

SC Sounds great. We'll keep them in.

RECOVERY Roger.

RECOVERY The flotation collar is approximately half way round the command module.

RECOVERY And the flotation collar is being extended completely around the command module.

RECOVERY The flotation collar did hang up somewhat. on the shroud lines hanging down, however the swimmers are untangling those areas.

RECOVERY Garble.

RECOVERY New Orleans go ahead.

RECOVERY Roger, request that the command module does not inflate flotation bags, would you check with the capsule to make sure it's all right, over.

SC This is Al let's go ahead, D, RAT.

RECOVERY Roger.

SC This is 14, we read too. We do not intend, do not intend to inflate our bags.

SPEAKER The flotation collar is completely around the command module and GARBLE.

RECOVERY Flotation collar appears to be attached, the swimmers are checking for equal spacing.

PAO The swimmers in the water now are from the swim 2 helicopter, piloted by Lieutenant Commander Thomas C. Bartholomew of South Bend, Indiana.

RECOVERY Flotation collar appears to be fully inflated.

PAO And we heard that report. The collar appears now fully inflated.

RECOVERY Swimmers are checking installation and checking flotation collar support straps.

RECOVERY One swimmer is climbing aboard the flotation collar. GARBLE.

APOLLO 14 MISSION COMMENTARY, 2-9-71, 1516 CST, 613/1B

SWIM Apollo 14, how do you read me?

SC Go ahead.

SPEAKER Roger, did you get a good fuel dump as far as you can tell?

SC That's affirmative. We got the complete burn to complete dump.

APOLLO 14 MISSION COMMENTARY, 2-9-71, 1516 CST, 613/2

SPEAKER	Recovery, Roger. Apollo 14, NEW ORLEANS.
SPEAKER	(Garble)
CAPCOM	Apollo 14, NEW ORLEANS.

END OF TAPE

SPEAKER Stand by one
SPEAKER Roger, what's verification of ship you have on VOV closure.
SC Okay, we'll get it for you right now.
SPEAKER Roger.
SPEAKER And the swimmer is (garble)
SPEAKER Reading, that's right.
SPEAKER With the coder, we're departing REAR position with the SL.
SPEAKER (garble) Recovery, Roger.
SPEAKER The first swimmer's in the water.
PAO The three swimmers in the water, now deploying a raft which they'll back off to a distance from the command module while the decontamination swimmer is deployed, and he will decontaminate the spacecraft area after the crew is - has gotten out, and he'll also hand in through the open hatch to them the masks that they will wear. The breathing masks, then the clean flight suits that they will don inside the spacecraft.
SPEAKER The egress raft appears to be open.
SPEAKER The egress raft is being attached to the floatation collar.
PAO The raft currently being attached to the floatation collar is the crew egress raft. This is the raft that the crew will get into after the hatch is open.
SPEAKER Egress raft has been attached to floatation collar. The egress raft has been attached to the floatation collar.
SPEAKER (garbled)
SPEAKER One raft
SPEAKER (garbled)
SPEAKER Approaches the command module.
SPEAKER Photo north.
SPEAKER And one raft is in the water, ready for (garble)
SPEAKER Roger. Can you confirm that all 3 canopys, that we can tow away and the empty shroud line that are dangling.
SPEAKER We'll try to, that is affirmative. That is affirmative.
SPEAKER One has been cut away, only one which is remaining (garble)
SPEAKER Roger.
SPEAKER (garbled)
SPEAKER And they are moving into position. Over.
SPEAKER There is one chute was hooker with the grappling hook. (Garble)
PAO The three swimmers, Lt. Junior grade Michael L. Slager, Reno, Navada, Yeoman Third Class Rudy R. Davis of Piketon, Ohio and Gunner's Mate Third Class, Larry F. Faller

PAO of Reading, Pennsylvania, will get into the second raft now, and await the arrival of the decontamination swimmer.

SPEAKER (garble) can get at least one up.

SPEAKER The swimmer will remove the cover hatch (garble)

SPEAKER Want them.

SPEAKER The swimmer is at command module with the (garbled) line. Over.

SPEAKER The swimmer's line is hanging attached to the egress raft.

SPEAKER Swimmer is returning to the egress raft.

SPEAKER One (garbled) is in line for recovery (garble) ready position..

SPEAKER The egress raft is being moved up wind from the command module.

SPEAKER Swimmer is in the egress raft.

END OF TAPE

SPEAKER (garbled)
SPEAKER And Swimmers circling to (garbled), Recovery, for the (garble) decontamination. Recovery is recording a ready position.
SPEAKER Swimmer One is (garbled)
SPEAKER Recovery approaching the spacecraft. Decontamination swimmer is in the water with the thumbs up. Recovery moving out in (garbled) to ready position. Decontamination swimmer is in the (garbled)
SPEAKER Recovery positioning for approach to decontamination gear.
SPEAKER (Garble)
RECOVERY Photo, say again.
PHOTO (garbled) Apollo 14, the probe (garbled) is going out now.
SPEAKER Roger (garbled)
SPEAKER (garbled) decontamination equipment..
SPEAKER (garbled)
SPEAKER (garbled)
PHOTO And Recovery, we're approaching - swimmer has the decontamination equipment (garbled) is approaching to hook up the chutes (garbled)
SPEAKER (garbled)
SPEAKER (garbled) approaching the swimmer
SPEAKER (garbled) on the water, The decontamination (garbled)
SPEAKER Decontamination (garbled) command module.
SPEAKER The decontamination equipment has been removed from the rescue net.
SPEAKER (garbled) The rescue net is being returned - returned to (garble)
SPEAKER Swimmers are putting on their swim gear.
SPEAKER (garbled)
SPEAKER Swimmers are continuing to put on their diving gear.

END OF TAPE

SPEAKER GARBLE.

SPEAKER GARBLE underwater and GARBLE examinations coming off easier.

SPEAKER 45 GARBLE.

SPEAKER 45 GARBLE to the command module.

SPEAKER GARBLE.

SPEAKER GARBLE the command module.

SPEAKER The swimmer is at the command module and GARBLE.

SPEAKER Give them the MOD container. Do they want this color?

SPEAKER The contamination equipment has been moved from the LM GARBLE of the GARBLE.

SPEAKER Garble. The decontamination swimmer is visually checking the astronaut through the hatch.

SPEAKER GARBLE.

SPEAKER Underwater recovery is now in decontamination.

SWIMMER Swimmer now GARBLE going into GARBLE.

CAPCOM GARBLE.

SC Okay.

CAPCOM Decontamination swimmer is removing the decontamination equipment bags.

SC GARBLE.

CAPCOM Go ahead.

SPEAKER Are the hatches being open. Is the decontamination equipment GARBLE.

SPEAKER GARBLE.

CAPCOM The swimmers are now waiting on the Astronauts to complete their clean off area drill. GARBLE.

END OF TAPE

SPEAKER (garble).

PAO The communications with the crew and the description of recovery activities are coming to us from Commander William E. Walker, the pilot of the prime recovery helicopter.

RECOVERY The astronauts are still putting on their decontamination suits. (garble) Roger. Report the crew are (garble)

SPEAKER Roger.

RECOVERY The hatch is being reopened. (garble) We visually sighted the (garble) slight angle that was (garble) the command module (garble) and it was between 1/4 mile and one mile (garble). And the first astronaut is outside the command module and has a (garble). A second astronaut is in egress now.

END OF TAPE

SPEAKER and the third astronaut has exited from the command module, and is in the egress raft.

SPEAKER The decontamination swimmer is closing the hatch to the command module. (garble) in the raft with the astronauts. And the swimmer is rushing it's way to the recovery. The swimmer is departing the ray of position. And the rescue net is coming out of the aircraft. The recovery approaching the command module. The rescue net is approaching the egress raft. The rescue net has been down in the water. And recovery is approaching the egress raft. The command module is being blown up on it's (garble). The rescue net is approaching the decontamination swimmer, and he has it. The rescue net is on the egress raft. (garble) complete now, the first astronaut, and I believe, it's astronaut Roosa is aboard the rescue net.

AIR BOSS Recovery helicopter reporting astronaut Roosa aboard the recovery net.

SPEAKER Next astronaut on his way up. The recovery moving up, and it is astronaut Roosa. That's confirmed, he's on his way up. Astronaut Roosa is half way into recovery hatch. Astronaut Roosa is on deck, and he is safely aboard recovery. Recovery positioning for second pick-up. The rescue mat is out of the hatch, and recovery is approaching the command module. The rescue net is approaching the egress raft, and the rescue net has been dropped in the water. The decontamination swimmer has the net, and placing it on the egress raft. The ancor has been placed in the rescue net, and the second astronaut is aboard. The astronaut is on his way up, and it's astronaut Mitchell. He's approximately half way up.

SPEAKER Astronaut Ed Mitchell - -

END OF TAPE

PAO Ed Mitchell reported the second crewman on the way up to the recovery helicopter.

HELICOPTER I Astronaut Mitchell is approaching the hatch to (garble)

HELICOPTER I The rescue net is in the hatch. Astronaut Mitchell is safely aboard recovery.

HELICOPTER I Recovery repositioning. Prepare to push. Recovery approaching for another pickup.

HELICOPTER I Recovery approaching the Command Module.

HELICOPTER I Rescue net is in the water, has been (garble)

HELICOPTER And the rescue net is approaching the egress raft.

HELICOPTER I Contamination swimmer has the rescue net aboard the egress raft.

HELO I The anchor has been placed aside and Astronaut Shepard is aboard, the rescue net.

SPEAKER The net is about half way.

HELO I Shepard is on the way up. Recovery is moving out from raft. Astronaut Shepard is (garble). Astronaut Shepard is approaching the hatch. Astronaut Shepard is safely aboard recovery.

SPEAKER (Garble)

SPEAKER Roger. Request you resume your original position.

HELICOPTER I New Orleans Recovery, Astronauts aboard and in o.k. condition.

RECOVERY New Orleans, Roger.

SPEAKER Photo switchback.

CAPCOM Okay.

HELICOPTER I And New Orleans, Recovery, (garble).

SPEAKER Tower (garble)

SPEAKER (garble)

END OF TAPE

PAO This is Apollo Control. The prime recovery ship reported its estimate on the splashdown coordinates agreed almost precisely with the onboard spacecraft readout, 27 degrees 2 minutes south, 172 degrees 40 minutes west. That splashdown occurred at 216 hours 42 minutes.

PAO And as the helicopter touched down on the deck we have a delighted crowd in Mission Control here applauding. Shortly the cigars will be lighted up as the crew steps out onto the deck of the recovery ship, the helicopter landing platform NEW ORLEANS.

END OF TAPE

APOLLO 14 MISSION COMMENTARY,2/9/71,1556 CST, 621/1

PAO The helicopter now being towed to the elevator to be taken below deck for the crew to egress and enter the mobile quarantine facility.

RECOVERY At this part of the operation wont be rushed because even if seas are relatively smooth as today, the ship does pitch and roll a bit and there's always some small danger of an aircraft that does not have choc blocks around its wheels and still being able to go towards the edge of the carrier. Extra care is taken. Now you see the helicopter being headed out onto the platform of this large elevator that will take it below deck. This carrier the "New Orleans" is probably less than 600 feet long about half the length of the largest carriers afloat. Also, relatively light, about 18 000 tons and its draft, that is the distance it settles into the water, is about 30 feet or so. There you see a shot from hangar deck. The deck to which the helicopter will soon be lowered and there's part of the ceremony being made ready now for the eventual arrival of the recovery helicopter. (music). And there you hear a navy band below deck, striking up in honor of the astronauts.

(music)

PAO The traditional cigars are being lighted up now by mission control by all the people who supported the mission from the staff support rooms around the periphery of the control center, pour in on the floor here, ready for the crew to step out from the helicopter.

RECOVERY Slowly the recovery helicopter is wheeled back off that elevator and into the large, sort of gymnasium size area in the center of this ship that is the hangar deck. It is here on this deck that NASA has established the mobile quarantine facility for the astronauts, they will spend two days in there, while the ship steams northward toward the island of American Samoa. Of course, from there the astronauts go on by plane to Houston. But, both on the ship and on the plane they will be staying in a sort of a modified trailer arrangement called a mobile quarantine facility.

END OF TAPE

RECOVERY One NASA doctor went into the mobile quarantine facility here on ship last Thursday evening. That was so he wouldn't get some last minute earthly illness from someone onboard the recovery ship transfer those earth germs to the astronauts while he's checking them out for possible moon germs. Now the recovery helicopter is just about back in the right spot for the astronauts to be allowed out of the helicopter and down these stairs and these are historic stairs, though they may not appear to be. Those stairs have felt the tread of every man who's ever walked on the surface of the moon. The hatch opening now, and here they come. The Apollo 14 astronauts. Waving, obviously glad to be back; glad it's over. Looking forward to getting all the way home once again. Posing for pictures now, Alan Shepard, Ed Mitchell, and Stewart Roosa. (Applause). The NASA physician entering the quarantine facilities with them and the NASA physiologist outside decontaminating the area by spreading his special disinfectant along the area along which they have walked. The NASA doctor in the mobile quarantine facility will spend about 3-1/2 hours checking over each of the astronauts later today. He conducted physicals on them shortly before their mission and he'll compare the data. The Captain of the ship, Robert Moore.

MOORE Gentlemen, on behalf of officers and crew of the ship and on behalf of all America, welcome back to Earth and especially welcome back to the U.S.S. New Orleans. To give thanks for your safe return our chaplain will now offer prayer.

CHAPLAIN Oh, Lord God, your blessings of safety to astronauts Shepard, Roosa, and Mitchell and success of their mission stirs world-wide gratitude and rejoicing. Bless the success of our technical progress to the enrichment of our souls. Grant our leaders and society as a whole the wisdom to translate the knowledge gained from this great creative experience into the service of all mankind and to the honor of your holy name. Amen.

MOORE Thank you Chaplain Fred Hill. It's now my pleasure to present Admiral Hayward in charge of the Task Foce 130, your recovery force. Admiral Hayward.

HAYWARD Hello, Al.

SHEPARD Tom, how are you doing?

HAYWARD Stu, Ed.

MITCHELL Hello.

HAYWARD Behind you, hanging from the overhead in a position that unfortunately you can't see at the present time, is a massive banner that stretches almost completely across the width of the hanger deck. And it probably stands 15 feet long and says, "All American welcomes Apollo 14 astronauts, Shepard, Roosa, Mitchell." And these words, brief as they are, represents the deep feelings of all the people who

HAYWARD have made up your recovery team. We are just tremendously impressed with the proceeding that this entire Apollo 14 mission has been carried out and tremendously impressed with how precise this successful splashdown recovery has gone. Your accomplishments and exploits over the last week and a half have reexcited men everywhere around the world and they have reaffirmed that men can still perform miracles if they will pull together in the same direction. And we're just tremendously impressed. What you have done has proven once more that men have the skill and the technical capability and the courage, the initiative, the stamina, and is willing to take risks, many of which he cannot even fully define in his search for new horizons to conquer and particularly in his peaceful conquests of our universe. I can assure you that nobody - nobody has a greater pride in what you have done, or is more elated in your being back here than the hundreds of people who have made up your recovery team. The men of the United States Navy, United States Air Force, The National Aeronautics and Space Administration, the many civilians that are here representing industry and the companies of our great country, we all collectively are tremendously proud and honored to have been provided the opportunity by you to play a small part in this just imminently successful mission and we applaud the magnificence in the way you have pulled it off and we salute you as fellow Americans. Now I'd like to introduce to you a man whom you all know, Major General Stevenson, who is director of operations from the office of Manned Space Flight NASA Headquarters in Washington. General Stevenson.

END OF TAPE

SPEAKER Gentlemen, on behalf of NASA, the Office of Manned Space Flight, and I'm sure I speak for the astronauts, I want to express appreciation for the recovery job that was done by the New Orleans, captain and crew and the officers and men of the helicopter squadron 6. In the business we're in, where there is little room for error, it is obvious that their emphasis on excellence in achievement made them worthy of a part of the Apollo team. Al and Ed and Stu, you've had a long trip to the moon. You overcame some major difficulties, you had a lot of nagging minor problems and you whipped all of them and you brought off a huge success for the mission. I want to tell you that the program and the country was never more sorely in need of a successful mission, the one that your brought off. I wonder if the three of you would - you'll probably be asked 1000 times about all the problems that went wrong. How about telling about your most exciting moments and most rewarding moments on your way to the moon.

SHEPARD Okay, let me start out. General Stevenson, thank you very much for your comment, and Tom, thanks a lot for your kind words. It sure is nice to be back home again. We appreciate the pickup, Captain Moore. Appreciate your kind words. We're glad to see the mayor of Houston here aand some other distinguished guests, and let me reecho your words about that fantastic recovery. We were still trying to get ready to get out when the boys were ready to have us. I don't think we've had a recovery as - handled as efficiently and as speedily and indeed as quick as that one. We've just tickled with it and we appreciate it very much. Of course, we did come kind of close to the target area, but that may be incidental. We have had a terrific flight, as the general points out. It's been just completely super all the way around. We've had a lot of problems - had some problems, but I don't think there is any question about the fact that for me the most thrilling moment is right now, not only because we're back from a trip to the moon, but also because I'm back home. Ed.

MITCHELL I think Al has said all that can be and need be said, but I would like to repeat the thanks to Admiral Hayward and Captain Moore, and General Stevenson for your very kind words. I think we have had a very successful trip. We all enjoyed it immensely. We had a good time doing it and it was worth all those little moments of doubt, when the problems arose, just to conquer them and be back and I would like to thank this recovery team for a beautiful recovery and especially might as well bring in our MOCR team that's done such a good job of getting us here in the first place. Thank you, gentlemen.

ROOSA After all the sentiments, my own personal thanks to everybody involved in the recovery. You know, in the last 9 days I've seen some rather fantastic sights, but I guess right up among the top of them is the sight of this

ROOSA carrier today, when we looked out that window of the hatch.

SHEPARD That's pretty good for an Air Force man.

ROOSA Yes, and speaking from an Air Force type, it's a real priviledge to fly Navy and we thank all of you.

SPEAKER Well to take you back a couple of days. Did the surface of the moon look like about what they had briefed you on before you took off on the mission or were there some changes from you had expected?

SHEPARD Well, actually from the standpoint of plan-form of the target area, General, it looked exactly what we had been practicing with. As soon as the vehicle pitched over for the final stages of the approach, I think Ed and I both simultaneously recognized the target area and recognized that the guidance and steering and trajectory were right - right in there on the target area. I had originally planned to land a little bit south of the targeted point because the maps and the the relief contours showed that to be a little more level, a little more smooth. But in fact it did not appear to be appropriate so we shifted a couple of hundred feet to the north and landed in an area that was smoother. It was on a little slope but after we got out and looked around we realized there really wasn't any level ground around there, so I think that we landed in a good spot and we certainly had a lot of good rocks to collect while we were there.

SPEAKER Was the trip up Cone Crater rougher or rockier than you had anticipated?

SHEPARD I think it just took us longer. We had no difficulty at any time, either in navigating around the larger rocks, the boulders, and going up the slope, not only with the vehicle, but also without it, and we took the vehicle all the way with us all the way up. We had no problems in navigating. It's just that there were so many interesting things to do it just took us so long to get there. It was just a matter of running out of time. We had a planned time to come back in, as you know, and it was just a matter of not having enough time to do all the things we wanted.

SPEAKER Al, today you were the last man out of the command module. You were also the first American in space. You have been the earliest and the latest, one of the shortest and qualifying for one of the longest, certainly the shortest and there are some of your friends here that say you can't harken back that far, but how about giving us a comparison between the first Mercury mission and the one you just came back from.

SHEPARD Well, General, frankly I'm not really a student of history, and as you pointed out it was a long time ago, and it was a great ride. This last one was a great ride, too. Also, fortunately, it will not be the last ride. There will be other flights going - space flights going to the moon and space laboratories and shuttles and so on, but

SHEPARD this was a great thrill, there is no question about it. I would like to say that I've worked with a lot of very talented people in my life, a lot of very dedicated people, but never have I worked with two more talented and dedicated people than I've got in here with me right now. Ed and Stu I think did a tremendous job, not only in the training program but also during the flight. Their dilegence and their hard work certainly contributed to the success of the mission to a tremendous degree and I want to take this opportunity to publicly thank them for doing a fantastic job.

MITCHELL Well, thank you Al. We had a great leader to work with and that helped a lot.

SPEAKER If I could say again that we welcome you back. I've got to return to the bridge to recover your spacecraft, but Admiral continue, and Admiral has a few questions about - one of our lookouts spotted that coming down and we found it on the flight deck, so maybe you can explain to the Admiral about that.

SPEAKER I don't care what anybody says, it's got to be the longest six iron in the world.

SPEAKER I understand it doesn't hook or slice up there. Is that right?

SHEPARD No, straight as a dye.

SPEAKER We hope to have the President on the line to you in the next few minutes, also, later on perhaps we'll get your wives and families on the telephone with you.

SHEPARD That will be fine, Tom, thank you.

SPEAKER I'd like to ask Stu a question. I've often wonder what the Lone Ranger's feeling like as he's going around the moon up there all by himself with people on both sides, but there you are, alone.

ROOSA Well, actually I was so busy that you really didn't have time to consider the fact that you're by yourself and I'd also spent so many hours in the simulator by myself that I think I was well prepared for it and by the time I got to the end of that first day in lunar orbit I was well tired and trying to get as much sleep, how little it was, before the next day that I really didn't have time to think - to dwell too much on being alone. I've always liked to fly by myself anyway. I've always considered more than one seat in an air plane too many so I think I was well suited for that.

SPEAKER You mean these guys were heckling you throughout the flight?

SHEPARD Listen, he had his own special music we wouldn't let him play when we were onboard so he had something to do while we were gone.

ROOSA Yeah, I had to get by myself to play my music.

SPEAKER Maybe you can't answer this because I know you do have so many restrictions on what NASA wants

SPEAKER you to discuss before a complete debrief, but probably the only major diversion from what you all call a nominal flight was the initial docking effort as you left the earth orbit and started on your way to the moon. Did you have any real concern that you were or weren't going to lick the problem and maybe have to abort?

SHEPARD Well, there was certainly some concern there, Tom, not only on our part but on the part of the people in Houston who were wrestling with the problem also. We had several - well, at least two alternatives I can think of that were not tried, levels of degree of difficulty perhaps beyond what we finally did. I don't think that really at any time that any of us ever thought that we wouldn't be able to get the two vehicles together, even if we had to open the hatches and go pressurized and reach out and pull them in.

SPEAKER Great. Most of the peole here have been at sea for a few days and unfortunately weren't able to watch on television any of the exploits, although we did get film aboard that showed the liftoff, and I know that the crew would very much appreciate -

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HAYWARD - - the crew would very much appreciate hearing perhaps Ed you could tell us what was the most impressive thing as you, made you moon walk out there. What, what really struck you the most.

MITCHELL I don't think anyone could every be prepared admirial. Either by prior discription or photograph with the starkness, the desolation, at the same time the magnificance of the landscapes that you see as you step out on the surface. The sky as opposed to the beautiful blue we have here, is cold black, with no atmosphere it's absolutely black. As compared with a very sharp horizon which is brown, or gray, depending on the lighting at the particular moment, and it is so clear, and it is so stark, and the shadows are so sharp, not, not soften by atmosphere at any way. That it is probably the most stark stark scene and desolution one can immagine, and yet completely magnificant. And there are very, it is very hard to fine the words that would express that same feeling because pictures certainly do not do it.

SPEAKER What do you think of Apollo 15, you leave some work up there for them to do?

MITCHELL Man, theres alot of work on that moon to do admirial. We need a, a lot of work.

SHEPARD A lot of rocks still left up there.

HAYWARD Well, when you got to Cone crater, did you run out of time, or would it had been the problem of getting to the top.

MITCHELL No, the top was too far away. There was just not enough time to do it. We could have spend more time at every stop we made, and we had to rush on and mission control was urging us on, and there were so many craters to look at, so many rocks we could have picked up. We could have gone further up Cone and around Cone and we had to hurry to come lopping back down the hill with out even getting to Cone crater, really the rim of it.

SHEPARD Yea, there were some fantastic sights up there and there was no question about that the boulders all looked diffenent than any boulders you've ever seen and the colors looked different as Ed pointed out, it's really very stark black sky, but I think that the crux of the matter is that we collected rocks from very close to the top of the crater and I'm sure that we've got some that were thrown out from that particular crater, which of course was the objective. They didn't necessarily have to come right from the rim, as long as they came from the crater. So, I feel that from that standpoint, that we were entirely successful on that particular part of the job.

HAYWARD We had a lot of thrills during this thing down here, I'll tell you during the recovery it was something to watch, we were able to pick you up, visuialy a long period of time before the main chutes deployed, and saw you come on down on the droge chute and the pop the main chute, and I don't

HAYWARD - - supose I'm one to spectulate on close you were, but it seems to me you broke the record with out much doubt about dropping down on target. You were dead ahead of the ship, and it was just no problem. I don't know if you could see the photo helicopter which was just along side of you when you were up still above the lower cloud deck probably 5 thousand feet and following you all the way down. It was a tremendous recovery and you were right smack on target and a great job.

SHEPARD With out even measuring it, Admiral, we'll believe it was a new record.

MITCHELL Yea, we'll take you word for it Tom.

SHEPARD Mayor Welch, we're glad to see you here today. Appreciate you coming out. Bringing your greetings from the city of Houston, we hope to be back in just a couple of days.

HAYWARD The skipper of the helio squadran is here some place, where is he, Bill. Well, I guess he ducked, no here he comes. Thought you might like to see the guy whose got these young fellows all charged up. Al, you and I don't remenber that the helicopter pilots can be as charged up as fighter pilots, but this bunch is, and they really do a great job.

SPEAKER Do you feel like saying something.

SHEPARD Yea, I really appreciate that pick up, that was smooth.

SPEAKER Thank you very much captain, it certainly was a pleasure for our squadran to participate in this event in the space program, and it certainly was a thrill in my life time to be on the receiving end of your trajectory in here.

SPEAKER It's pretty obviously, pretty obviously thrills very well. It was a very smooth operation.

SPEAKER Well, we had some good instructors. I think they've got it down pat now. We'd be very happy to do it any time.

SPEAKER Thank you.

HAYWARD I think we will go ahead and conclude this ceremony. The call hasn't come in yet, and I know the doctors are anxious to get on with the probing and the problems that you've got to put up with.

MITCHELL Keep talking John, keep talking.

HAYWARD Well, I do want to tell you how good it is to have you back here. We all just tremendously elated over the whole thing and we really ought to say again, that the entire country owes you a great debt of graditude, and the admiration of what you have done, and particularly for showing that free men can still dare to dream and go ahead and fulfill their dreams. And you've done it in the sight of the whold world, and we're just fantasticy proud of what you've done. We'll see you tomorrow.

SPEAKER - - and so all those days of practice by the ships crew, the helicopter pilots, navy swimmers, and NASA officials paid off. After the carrier picks up the command module, which it will be doing in just a few minutes, it goes on to American Samoa and on that island the astroanuts board that awaiting jet plane and then they will be on the last leg of their journey home to Houston. Tony Sargent aboard the carrier New Orleans.

END OF TAPE